JANUARY 11, 1999 VOLUME 16, NUMBER 2

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

A CISCO "crash" COURSE

Company issues a fix for a bug in its new routing software. Page 8.

STRIKING back

By Winn Schwartau

Corporate vigilantes go on the offensive to hunt down hackers.

In September 1998, the Electronic Disturbance Theater, a group of activists that practices politically driven cyber civil disobedience, launched an attack aimed at disabling a Pentagon Web site by flooding it with requests. The Pentagon responded by redirecting the requests to a Java applet programmed to issue a counteroffensive. The applet flooded the browsers used to launch the attack with graphics and messages, causing them to crash.

The incident raises issues all user organizations will soon have to grapple with, if they haven't already. When you detect a break-in, should you launch a counterattack in order to protect your network? Is law enforcement capable of stopping cybercrime and can it be trusted to keep investigations quiet? If not, don't corporations have a right to defend themselves?

Some emboldened user organizations are answering "yes." They are striking back against hackers, sometimes with military efficiency and intensity, in an effort to protect their self-interests. In the process, they are fueling a debate over what is legal and ethical in terms of corporate vigilantism.

See page 33

DAVID SCOTT SINCLAIR

Market woes force Compaq net retreat

Under reorganization, internetworking group pushes smaller product portfolio.

By Deni Connor

Three years ago, Compaq declared its intention to become a network industry leader — leadership to be earned by dint of advanced, aggressively priced products, and through acquisitions worth hundreds of millions of dollars.

Hamstrung by a strategy that was poorly defined and not terribly ambitious, Compaq last week retrenched. The company is moving key network lines into PC and server groups, and is preparing pink slips for many of its network folks.

The company has moved server adapters into its server group, and shifted modems and workstation adapters into its PC group. Its hubs, switches and routers will remain in the

See **Compaq**, *page 52*

"There is not a P&L business focus associated with networking anymore."

B. J. Johnson, vice president of the Network and Access Communications Division at Compaq

STEVE BORNS

Developers jumping on Sun's Jini, but products may be slow to show

By Chris Nerney

Within weeks, as many as 20 third-party hardware and software vendors will announce plans for products that will bring to life the dream offered by Sun's Jini technology — to "network anything, anytime, anywhere."

But don't expect Sun's new Java technology to change life as you know it quite yet. Only one vendor has aired plans to ship a Jini-enabled product this month, and others hint that their products may not support the technology for a while.

Under Sun's scenario, Jini-enabled hardware and software plugged in to a network will automatically begin interacting with other Jini devices, without the need for configuration, or driver or device installation.

Sun initially positioned Jini

See **Jini**, *page 51*

Get more online:

- Jini technical details.
- An overview of BizTone.com's Jini-based apps.

1032

www.nwfusion.com

Ex-MCI customers hit by Cable & Wireless blues

By Denise Pappalardo

Complaints about a lack of customer service, sales support and general responsiveness have caused some of Cable & Wireless USA's new Internet customers to cancel their contracts and bolt to competing service providers.

For its part, Cable & Wireless admits there have been problems in the three months following its $1.7 billion purchase of MCI's Internet business, but executives say the company has been adding more new customers than it has been losing.

"Quite a few relationships between customers and sales reps were severed," says Tom

See **Cable & Wireless**, *page 51*

IBM presses for new IP Security implemention

By Ellen Messmer

Research Triangle Park, N.C.

Though the IETF recently sanctioned the IP Security (IPSec) protocol as a proposed standard, IBM in the next few weeks will pitch an improved version of the protocol that the company plans to implement in products ranging from mainframes to firewalls.

IBM's proposal, to be presented shortly to the IPSec Working Group, goes beyond

See **IPSec**, *page 14*

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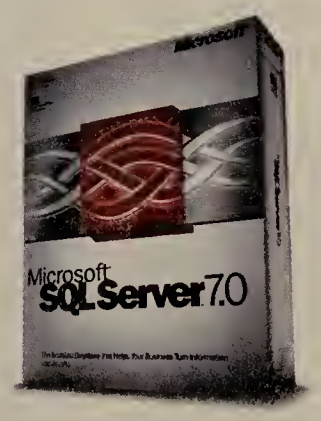

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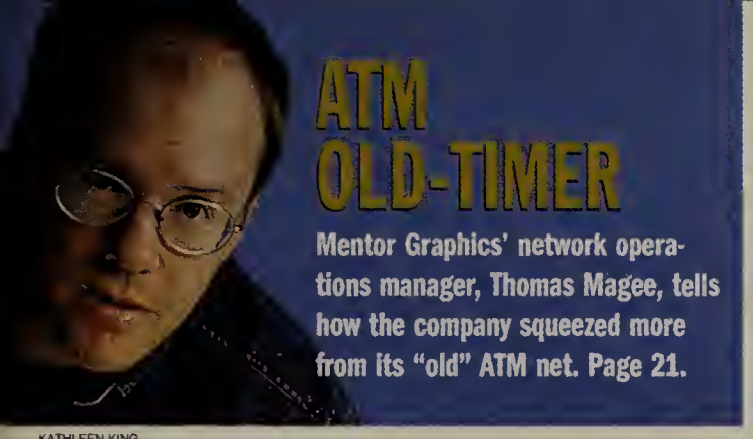

KATHLEEN KING

ATM OLD-TIMER

Mentor Graphics' network operations manager, Thomas Magee, tells how the company squeezed more from its "old" ATM net. Page 21.

SERVER STRENGTHENER

Server vendors are rallying around Intel's new 450-MHz Pentium II Xeon processor. Page 17.

ED CALDWELL

CISCO'S IN THE HOUSE

Cisco CEO John Chambers has the company targeting the home network market. Page 12.

NetworkWorldContents

January 11, 1999 Volume 16, Number 2

News

Local Networks

Internetworks

Carriers & ISPs

Intranet Applications

Technology Update

Opinions

DAVID SCOTT SINCLAIR

SPECIAL FOCUS

Managing the enterprise

CIM-plifying net management. Page 23.

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Hackers. How far would you go to punish someone who broke into your net? Read our front-page story, then come online for a forum to discuss it with your peers and security expert Winn Schwartau. **DocFinder: 1021**

Water Cooler. News that modem maker Hayes has finally gone out of business prompts Editor John Dix to reminisce about the early days of the network revolution. **DocFinder: 1038**

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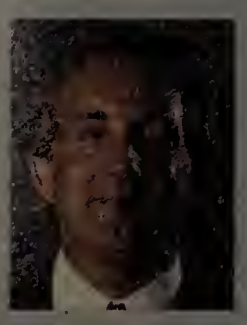
News briefs, January 11, 1999

Kapor crosses over to the dark side

The world of venture capital just became more interesting. One of the computer industry's true pioneers and most eclectic characters has signed on with one of the hottest venture firms in Silicon Valley. Lotus founder, cyber rights champion and occasional enlightenment seeker Mitch Kapor has been named a partner at Accel Partners in Palo Alto. Unlike any number of faux visionaries, Kapor is the real deal. He started Lotus in 1981, cashing out a few years later when running the corporation began to bore him. He co-founded the nonprofit Electronic Frontier Foundation in 1990, years before there was a World Wide Web on which to have your rights violated. Kapor has been working with Accel for the past several years, most notably as a board member of streaming media start-up Real Networks.



Kapor *joins the ranks of Accel Partners.*

FCC to vendors: Don't like your idea, but keep trying

Federal Communications Commission Chairman William Kennard is not taking the bait being dangled by Compaq, GTE, Intel, Microsoft, four regional Bell operating companies and other vendor heavyweights. The companies have proposed that the RBOCs be allowed to carry data traffic beyond local calling areas — and to drop the requirement that they wholesale data lines to competitors — in exchange for a much broader digital subscriber line rollout (*NW,* Dec. 14, 1998, page 1). "It's sometimes a little seductive to perpetuate a monopoly in exchange for these high-bandwidth networks," Kennard said last week. But he added that the vendors' plan could hurt the overriding goal of competition from smaller data carriers. The FCC later this month will vote on a more limited proposal to grant RBOCs some data deregulation, without any long-distance authority.

Do I have to give you two a timeout?

Like an impatient parent admonishing his bickering children, U.S. District Court Judge Ronald Whyte has ordered Java combatants Sun and Microsoft to settle their differences themselves. In an order dated Dec. 29, 1998, but made public only last week, Whyte told the two parties "to immediately schedule a settlement conference." Both companies have agreed to comply with the court's instructions, though no meeting has been set. Sun filed a lawsuit against Microsoft in October 1997, alleging the software giant had violated its Java licensing agreement by releasing a commercial product — the Internet Explorer 4.0 browser — that was not fully Java-compatible.

The Big Apple?

Apple CEO Steve Jobs used the MacWorld Expo spotlight in San Francisco last week to tout a new server operating system. Dubbed the Mac OS X Server, the software includes a key new feature that Jobs called "Net Booting." Net Booting enables Macintosh clients to boot-up over a network without having the operating system installed on each client. The package, which will ship in February for $990 per server with unlimited client hook-ups, also includes the Apache Web server.

Brainy start-up seeks to solve Web problems

Akamai Technologies will unveil itself this week. The Cambridge, Mass., start-up is prepping a service called FreeFlow to speed up access to corporate Web sites. Backed by technology from Massachusetts Institute of Technology mathematicians, the company boasts a network of proxy servers governed by software that distributes customer content. When a customer Web site is barraged with hits, Akamai servers share the load so the source server doesn't get swamped, the company says.

Linux vendors crank out features

By Robin Schreier Hohman

Linux has gotten a lot of press, gained a bevy of users and will soon be bolstered by a bunch of new features.

Some of the new items include:

- An open-source graphical user interface (GUI) that could help spur acceptance of Linux on the desktop.
- Drivers for ATM and token-ring networks.
- The ability to run distributed applications.
- Parallel processing features that let linked Linux boxes rival supercomputers.

The hottest item on the agenda right now may be GNU Network Object Model Environment (GNOME, pronounced guh-nome), a project to build a new open source GUI. Once GNOME is complete, the Linux faithful will be able to choose between two GUIs.

The other interface, called KDE, is offered by Caldera Systems and S.u.S.E., a European-focused Linux provider. The KDE interface is not completely to the liking of the open-source-mad Linux community because it is proprietary; that is, it can't be freely distributed and altered, as Linux can be.

Recently, Troll Tech, the Norwegian maker of the tool kit used to create KDE, relaxed its licensing requirements. But it'll be awhile before new, fully open source code is generated.

Other forms of Linux, such as the one offered by Red Hat Software, do not have a graphical shell and rely on a command line interface to copy or search for files, or to browse directories.

From the get-go, the GNOME interface will be completely open source and can be modified in the same way as Linux, its advocates brag. KDE fans, however, argue that their system is more established and has a more stable code base.

For some, the argument is academic. Caldera says business customers want a functional, stable, integrated and tested solution — not necessarily the latest release of code.

"Deployment of Linux in the enterprise is going to be predicated on its ability to be integrated seamlessly, without a great deal of pain," says Drew Spencer, vice president of engineering for Caldera.

Linux rival Red Hat is betting heavily on GNOME, and the company devotes six full-time programmers to writing GNOME code. Marc Ewing, Red Hat's chief technology officer, says GNOME 1.0 should be shipping within a few months.

The GNOME team is nothing if not ambitious. Ewing says GNOME developers are trying to create a more stable and more intuitive interface than that of Microsoft Windows.

Another promising project is what self-appointed Linux evangelist Eric Raymond calls "supercomputers on the cheap." The plan is to link a bunch of Linux computers together with Fast Ethernet and have them perform high-level parallel processing. Once the base technology is done, developers can step in and write or port applications. Raymond became a Linux celebrity of sorts in the fall, when he posted the "Halloween memos," internal Microsoft documents in which executives discussed their innermost Linux fears.

In order for Linux to be a good network citizen, drivers have to be written for each ATM, token-ring or Ethernet network interface card that a Linux user wants to control.

Currently various people are trying to write drivers for most, if not all, major ATM and token-ring devices. This is an ongoing effort. Each time the Linux operating system build changes, someone has to make sure the drivers work with that build.

There are current device drivers for some ATM cards from FORE, SMC, Essential, Integrated Device Technology and ZeitNet. For token-ring, there are current drivers for Olicom's OC-3118, OC-3136 and OC-3137 cards. There are also efforts underway to create drivers for IBM Token-Ring cards, although they are further from completion. While there are many drivers already available for Ethernet cards, more are being developed.

Proponents of the Distributed Computing Environment have a boost with the DCE Port to Linux Project, which will eventually enable users to port applications to Linux. Currently, there are no complete libraries available.

Finally, the Blinux project, a word play on Linux and blind, seeks to create software so that blind users and deaf users can run Linux workstations. ■

WACKY LINUX ACRONYMNS

GNU: The original free software project, started in 1984 by Richard Stallman. Stands for "GNU's Not Unix."

Freax: Linux creator Linus Torvalds' original name for the operating system. Doesn't stand for anything.

Blinux: Software that will help blind and deaf people work with Linux.

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Showdown to accent frame relay choices

Lively ComNet/DC '99 session promises to help users prepare for future implementations.

By David Rohde
Washington, D.C.

Users who are thinking of establishing a frame relay network or expanding an existing one have a major worry right now: Does frame relay really fit into the future of converged networks built around pervasive IP applications?

Before you commit to a long-term contract, you can compare the broadest possible range of leading local, national and international frame relay carriers in one fell swoop at *Network World's* Frame Relay Showdown taking place at the ComNet/DC '99 show here on Jan. 26.

The presidential-style debate will pit seven carrier representatives against one another as they explain whether their offerings can meet today's demanding frame relay requirements. And the debate will require company executives to field tough questions from a panel of three industry watchers.

Key questions likely to spark debate include:

- Whose frame relay services work most easily with Internet backbones, ATM and IP virtual private networks? How can users prevent current WAN investments from being wasted in the future?
- Why do port prices on long-distance carriers' frame relay services tend to be so much higher than local carriers' prices?
- Do you really need to buy more expensive permanent virtual circuits from a carrier for frame relay voice, or is the value all in the premises equipment?
- Which carrier programs that add specialized frame relay or multiservice access devices — as well as routers optimized for SNA host sites — are best for users planning to keep a multiprotocol network for years to come?
- Was the AT&T frame relay outage last year a fluke or a recurring danger? Could it happen to any carrier?

The debate will also try to determine exactly what class of carrier, or combinations of carriers, is best for different users' geographic requirements.

For example, many regional Bell operating companies have built frame relay Network-to-Network Interfaces (NNI) between their services and newer frame relay specialists, such as Intermedia Communications. That's because Intermedia is not barred from carrying long-distance traffic, and many users like using RBOCs for local clusters of sites but still need to connect to some far-flung locations.

By contrast, some long-distance carriers claim NNIs are clumsy at handling certain features, yet they use them for international frame relay connections with partners.

Meanwhile, international carriers urge users to find a uniform global network that hasn't been pieced together from a variety of providers. Who's right?

The carrier panel will include representatives from the three market share leaders: AT&T, MCI WorldCom and Sprint.

Also on the panel are representatives from the market share leader among RBOCs, US WEST, and Intermedia, which started as a competitive local carrier. Rounding out the panel are executives from long-time international powerhouse Infonet and the aggressive new broadband carrier Qwest.

The expert panel will include Steve Bell, founder of the Silicon Valley Networking Lab, a testing and consulting organization; Atul Kapoor, senior vice president and head of network analysis at The Tolly Group in Manasquan, N.J.; and David Rohde, a senior editor at *Network World.* The moderator for the Frame Relay Showdown will be John Gallant, editor in chief of *Network World.* ■

The Showdown Lowdown

NetworkWorld SHOWDOWN

Who: Vendor participants: AT&T's **Joe Lueckenhoff**; MCI WorldCom's **John Scarborough**; Sprint's **Brad Hokamp**; Infonet's **Bob Da Glau**; Intermedia's **Michael Johnson**; US WEST's **Janice Aune**; and Qwest's **Mack Greene**.

Participants will face questions from an expert panel: **David Rohde,** a senior editor at *Network World*; Tolly Group Senior Vice President **Atul Kapoor**; and **Steve Bell,** founder of the Silicon Valley Networking Lab.

What: A presidential-style debate led by *Network World*'s Editor in Chief, **John Gallant,** in which the vendor participants will field questions from a panel of experts, each other and audience members.

When: 1:30 to 2:45 p.m., Tuesday, Jan. 26.

Where: ComNet/DC '99 in Washington, D.C., Grand Ballroom, Renaissance Hotel.

For more hot stuff happening at ComNet/DC '99 see:
Page 39

Bug crops up in new Cisco software

Fault in IOS 12.0 can crash routers when packets are sent to mgmt. port.

By Jim Duffy
San Jose

No sooner did Cisco announce the release of the newest version of its routing software then the bugs started showing up.

Cisco's IOS 12.0, which the company released on Dec. 21, 1998, has a bug that can crash routers when packets are sent to the devices' syslog ports, which generate router event messages used for managing the devices. John Bashinski, a member of Cisco's product security response and escalation team, reported the defect on the BUGTRAQ mailing list on Dec. 27, 1998.

The bug can also crash devices running IOS versions 11.3AA and 11.3DB, the BUGTRAQ posting says. Cisco recently began issuing fixes for the bug, according to one user. But a Cisco spokesman says not all of the fixes have been released yet. "The fixes are being tested," he says.

Though the posting states that Cisco customers have not yet reported any attacks, it also says the bug is easy to exploit because it can be triggered by packets from a popular port scanning program.

"Administrators should be on the lookout for potential exploitation of this bug," Bashinski says in his message.

Cisco user ADC Telecommunications in Minneapolis says the bug potentially could have affected four of its internal routers. But Cisco recently issued software fixes, and the ADC routers were not affected, says Roy Hegge, senior network engineer at the firm.

Users can also apply an access list to block incoming syslog traffic as a workaround, Bashinski suggests. The access list needs to block syslog traffic destined for any of the router's own IP addresses or for any broadcast or multicast address on which the router may be listening. The access list should be applied to all interfaces running IP, the posting states.

This workaround, however, may significantly slow performance on some routers, Bashinski warns.

"The impact isn't usually extreme, but it may make a difference on a router that's already heavily loaded," Bashinski says. "Install it with care if you install it."

IOS 12.0 features quality-of-service, scalability and, ironically, security enhancements, in addition to voice support, Cisco representatives say. The security features include integrated firewall, authentication and IP Security tunneling.

IOS 12.0 is available now for Cisco's routers and switches.

✆ Cisco: (408) 526-4000

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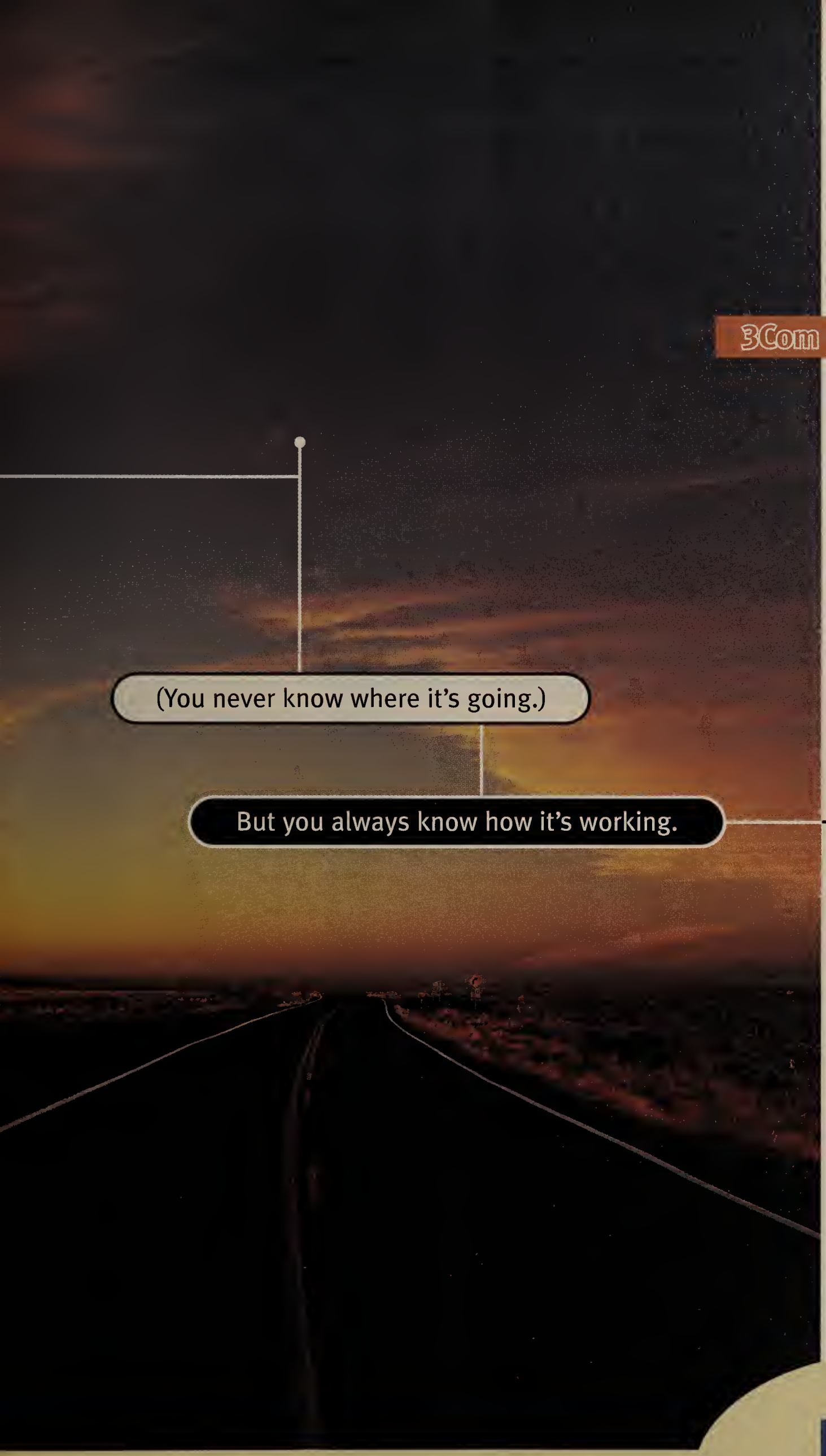

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Vendors boost Y2K software testing packages

Novell and Microsoft offer new tools to help users track and fix the millennium bug problems across their networks.

By Christine Burns

Novell and Microsoft have taken big steps to help customers identify Year 2000 issues across their networks.

Novell — which has received user accolades for its Y2K efforts thus far — last week announced plans to distribute two tools that will help customers identify millennium bug problems across their NetWare networks.

Microsoft — which to date has been widely criticized for a piecemeal Y2K strategy — announced a comprehensive plan for testing its products for compliance.

Novell announced the availability of its Year 2000 Information Ferret software and Check 2000, software it licensed in August from Greenwich Mean Time. Together, the tools let administrators tap into Novell Directory Services to obtain the Y2K status of all Novell clients and servers. The tools produce reports that tell administrators what software needs to be upgraded for Y2K compliance.

Novell's Year 2000 Information Ferret is available free from Novell's Web site. A five-user version of Check 2000 will be distributed with Novell's desktop management suite, ZENworks 1.1.

Novell officials say all of the company's current products are now Y2K ready. However, Novell has discontinued more than 200 products in the past nine months and does not guarantee that those products — including GroupWise 4.0 and NetWare 3.11 — are compliant.

"It made no sense for us to test every product we ever built," says John Canfield, Novell's marketing manager for Year 2000 compliance. "We make it very simple for any user of discontinued products to upgrade to a version that we have tested for compliance."

Microsoft announced it has certified 93% of its products as Y2K compliant. In addition to ensuring that all future products are Y2K compliant, Microsoft says it will ship Y2K patches as necessary for older versions of selected products, such as Windows 95/98, NT 4.0, the BackOffice suite and Office 95/97.

Microsoft is also making available a series of tools that will help users identify Y2K issues in installed Microsoft software. The company is pushing its upcoming release of Systems Management Server (SMS) 2.0 — one of Microsoft's BackOffice components — as the best way to track Y2K issues in its product line.

When SMS 2.0 ships later this quarter, it will include a Y2K product analyzer that compares installed software to a compliance database and suggests steps to remedy any issues. SMS 2.0 can also be used to distribute Y2K software patches and to lock down desktops so noncompliant software cannot be installed.

Microsoft has made the Y2K product analyzer software available at www.microsoft.com/technet/topics/year2k/tools/tools.htm for customers who will not have access to the SMS 2.0 package.

Other services offered at the site include an e-mail subscription service that offers biweekly compliance news and an e-mail alias to which users can send their Y2K questions.

© Novell: (888) 321-4272; Microsoft: (888) 673-8925

Cisco to announce Web-to-host Java client software

By Marc Songini

Cisco is offering new low-priced software for SNA users who need quick, easy Internet access to 3270 applications on the mainframe.

The company this week is expected to announce and deliver WebClient, an entry-level, Java tn3270e client software package that costs $50 per user. Cisco claims WebClient is for use on intranets and for establishing simple communications between companies that don't need data encryption. The software will let users access the mainframe without having to go through an intermediary Web server, which is typically required for Web-to-host sessions.

WebClient software is downloaded from Cisco's Web site to any desktop equipped with a Microsoft Explorer or Netscape Navigator browser, and can establish sessions with multiple hosts. Once a user opens the WebClient application on his desktop, a Java applet is launched, which traverses the 'Net and establishes a session with a designated SNA mainframe.

After the host authenticates the user and establishes a session, users can access 3270 data and cut and paste it into other applications. WebClient will run over any tn3270 gateway device, including Cisco's Channel Interface Processor, which links the company's Series 7000 and 7500 routers directly to mainframes.

"Other vendors aren't paying attention to this entry-level market," says Lori Bush, product line manager for Web-to-host products at Cisco's Interworks business unit. Most SNA access customers are buying more function than they need in their Web emulation packages.

Cisco hopes WebClient will tap a growing market for Web-to-host software, says Cindy Borovick, an analyst with International Data Corp. (IDC), a market research firm in Framingham, Mass. IDC estimates that the 1998 Web-terminal emulation market was worth $60 million, and Borovick predicts that number will grow to about $1 billion by 2002.

WebClient will complement Cisco's more expensive OC//:WebConnect Pro Web-to-host offering, which has more features.

© Cisco: (408) 526-4000

CORRECTIONS

Fred Baker

A write up about Fred Baker, chair of the Internet Engineering Task Force, appeared with the wrong photograph in the story "50 more people who make a difference in enterprise networking" (*NW,* Dec. 28-Jan. 4, 1998, page 44). The photograph published was of Jerry Baker, CEO of Network Computing.

Revenue numbers for Intel were misstated in the story "The 10 most powerful companies" (*NW,* Dec. 28-Jan. 4, 1998, page 6). Intel estimates its revenue for 1998 will be $20.6 billion.

CLARIFICATION

In the story "HellsAngels.com" (*NW,* Dec, 21, 1998, page 1), there was a sidebar listing biker organizations and their Web sites. Because of the context, some readers may have wrongly assumed *Network World* was claiming these clubs were so-called "outlaw" organizations. However, we did not intend to imply that any are outlaw motorcycle groups.

Home is where the network is

By John Cox

Las Vegas

Cisco, Compaq, IBM and Microsoft were among the big-name enterprise network companies feeling "homey" at last week's Consumer Electronics Show (CES) 1999.

The companies discussed and demonstrated a bevy of home network products based on Internet, telephony and wireless technologies, among others.

Home networks are essentially the same kind of LANs that have become staples at businesses. Like office LANs, home networks also feature WAN links.

With a home net, there's an immediate, practical benefit: Two or more PCs can share a printer, files and a single connection to the outside world. In the future, home net enthusiasts predict customers will also be able to interconnect palm-size PCs, Internet or e-mail access devices and Webphones, not to mention DVD players, set-top boxes and dishwashers.

"For a lot of these kinds of vendors, they see the home as a new market," says Kairuna Uppal, an analyst with The Yankee Group, a market research firm in Boston. The Yankee Group estimates that the number of U.S. households

See **Home nets,** *page 14*

Ganymede to keep an eye on apps

By Jeff Caruso
Research Triangle Park, N.C.

Network managers who want to track down problems in their networks and applications may take some comfort this week from Ganymede Software's plans to update its management software.

Ganymede's past tools have managed network performance, but by next year, the company promises to have a more complete system for monitoring applications. Ganymede representatives say the company's products will help managers plan for applications, as well as test, monitor and find problems in them.

"I really think they're heading in the right direction here," says Dennis Butcher, network consultant at Los Angeles oil company Atlantic Richfield Co.

Butcher says Ganymede's network performance management products currently help him check overall performance, but he has to use other tools to find the exact point of any bottleneck. The upcoming improvements should help him identify whether a bottleneck is occurring in a server, a client or the network, he says.

At the end of this month, Ganymede will ship its Application Scanner, software that helps create scripts to emulate applications and test their performance over a network. The company is also posting a library of premade scripts on its Web site. Application Scanner will run on Windows 95, 98 and NT. The new software will cost $4,500.

This summer, Ganymede plans to unveil software to measure end-to-end application performance. The Pegasus Application Monitor will be a companion to Pegasus network monitoring software, which has been shipping since July 1998.

Pegasus Application Monitor will measure the response time and availability of applications, generate alerts when problems occur, and track service-level agreements. Pricing is not available.

Ganymede says the combination of the application monitoring software and current network performance monitoring products will give network managers a complete view of the performance end users are experiencing.

While the application monitor will help network managers find problems and spot trends in application performance, other Ganymede products that assist in planning and deploying applications won't be available until 2000.

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BIT BY BIT

Ganymede Software over the next six months plans to update its software so it can more completely manage networks and applications.

January:
Introducing tools to help create scripts that emulate transactions and measure application responses.

March:
Releasing Pegasus Network Monitor 1.2, which will show network performance trends.

Spring:
Issuing Chariot 3.1, which will allow other products to retrieve network performance data from it.

Summer:
Introducing Pegasus Application Monitor, which will measure end-to-end application performance.

THE MICROSOFT DIARIES

Week Ten

The Microsoft-DOJ Trial

MONDAY, JAN. 4

We're back in the legal saddle after two weeks off, and it doesn't seem as if either side in the Microsoft-Department of Justice case is willing to extend the season of good tidings. Government witness William Harris, CEO of personal finance software maker Intuit, was on the stand today, asserting that Microsoft has a stranglehold on the software industry.

Intuit's Harris: *Microsoft has a stranglehold on the industry.*

The court, Harris said, should force Microsoft to give all companies equal access to the operating system.

Microsoft lawyer John Warden characterized Harris' suggestion as a ludicrous attempt to establish a "national operating system commission."

TUESDAY, JAN. 5

There's fear and loathing in Redmond for any type of cross-platform support. That was the point the government tried to make when it entered into evidence an e-mail from Windows bigwig Jim Allchin to Microsoft CEO Bill Gates. In the message, Allchin complained that any Microsoft attempt to support applications that run on non-Windows platforms is an effort to dilute Windows. "I consider this cross-platform issue a disease within Microsoft," Allchin wrote.

The government today also introduced its twelfth and final witness, economist Franklin Fisher. Fisher served as a defense witness when the government targeted IBM as an antitrust offender in the 1980s. This time, in his written testimony Fisher claimed Microsoft's anticompetitive conduct is a threat to innovation. Microsoft lawyers tried to discredit Fisher, noting he has logged more than 30 hours at $500 a pop preparing for this case. Microsoft attorneys also cited two other antitrust cases in which Fisher's expert testimony was criticized.

WEDNESDAY, JAN. 6

Judge Thomas Penfield Jackson today used Fisher's testimony about how the Netscape/America Online merger will affect Microsoft as an opportunity to say he'd like to hear from AOL CEO Steve Case on the matter.

Jackson had a newspaper article in which Case says the merger has no bearing on the lawsuit. Neither side plans to put Case on the stand.

THURSDAY, JAN. 7

Despite persistent badgering from Microsoft attorneys, the government's final witness stood firm in his assertion that Microsoft is a menace to competition. Fisher, his voice rising at times in anger, argued that "choice is what competition is about."

Microsoft lawyer Michael Lacovara took Fisher through a series of questions regarding testing and support costs incurred by equipment manufacturers that install multiple browsers on a PC. Lacovara suggested that it would be better, from a manufacturer's perspective, to have the browser preinstalled with the operating system.

But Fisher compared having a single browser on the market to having a single car available to consumers.

"If we're going to live in a Microsoft world, it may be a nice world, but it won't be a competitive world," he said.

— Christine Burns

Home nets

Continued from page 12

with at least two PCs is 12.4 million, and that's a figure vendors can get excited about.

Cisco CEO John Chambers last week said his company has established a new division targeting "personal networks" for consumers. Initially, the division will work with ISPs to help them build high-speed links to homes, and Cisco will issue licenses for software technology to support new services and applications. Later, Cisco will develop and sell a plug-and-play home LAN.

Other companies have created a technology for running Ethernet over existing telephone lines in the home. The technology is being promoted by the Home Phoneline Networking Alliance (HomePNA). Cisco based its home net demo at CES 1999 partly on devices running a chipset from Epigram that implements the HomePNA standard.

ED CALDWELL

Cisco CEO John Chambers *emphasized his company's commitment to home networking by appearing at CES 1999.*

Several alliance members introduced products as well. Diamond Multimedia Systems released the HomeFree Phoneline network, priced at about $50 per computer. The company's offering includes network cards that enable computers to plug into existing phone jacks for Internet access.

IBM unveiled its Web Point Internet Distribution Center, a $579 box that lets several home computers share a single Internet connection.

Microsoft announced Universal Plug-and-Play, a technology that will let users plug new devices into their home nets and have the equipment run almost at once. Microsoft paid Tut Systems to develop the Ethernet-over-phoneline technology promoted by HomePNA. ■

IPSec

Continued from page 1

the baseline encryption and authentication techniques defined in the current security protocol. IBM's new proposal tackles the complex IP address management problems that arise when remote access users are allowed into an intranet using IPSec.

Though the fate of IBM's proposal is uncertain, the company will soon introduce IPSec client software based on the new technology. IBM also is busy swapping out the current IPSec protocol for the new version in its e-Network Communications Suite, which consists of firewalls and other products used to support electronic commerce applications.

According to IBM Senior Engineer Charlie Kunzinger, the new version of IPSec will solve a basic security management problem that occurs when a remote access user is allowed into a corporate intranet after proving his identity at the corporate security gateway.

"At that point, you have to change the user's IP address, and that's a problem," Kunzinger says. The user's new address needs to be assigned from a pool of corporate IP addresses so the remote user looks like part of the local network. The technology IBM is pitching can keep track of these users and restrict their access to certain resources.

IBM's technical proposal is based on ideas compiled by Ashley Laurent, a small firm in Austin, Texas, that for a decade has written network system software for industry giants. With IBM, Microsoft, Cisco and many others throwing their weight behind IPSec as the virtual private network standard of choice, Ashley Laurent has started attending IETF meetings to follow the action. And now that IBM is backing Ashley Laurent's ideas for a new IPSec, the firm — which only has nine employees — could end up leading the IETF pack.

IPSEC EXTENSIONS

IBM is pitching two key extensions to the IETF's virtual private network standard. They are based on technology from Ashley Laurent, a small Austin, Texas, firm.

Internet Name Space
Enables IPSec gateways to assign remote access users IP addresses consistent with the corporate IP addressing scheme. The technology also lets the IPSec gateway separate secured traffic from nonsecured traffic.

Topology Information Exchange
Transmits to IPSec clients information needed to locate Web servers and other resources on corporate nets.

According to Jeffrey Goodwin, Ashley Laurent CEO, the firm's Internet Name Space technology lets the IPSec gateway automatically assign an IP address to a remote access user. The firm also has developed Topology Information Exchange technology, which provides a way to transmit network topology information about Web servers and other corporate resources to a user's IPSec-based remote access software.

The Ashley Laurent technologies also extend IPSec beyond pure TCP/IP to include networks and clients that rely on Microsoft's NetBIOS over TCP and Novell's IPX/SPX.

Ashley Laurent also is currently selling its VPCom Server product, which can plug into IBM's e-Business Firewall to provide enhanced IPSec functions. Guardian Life Insurance is testing this equipment in order to allow its agents in 3,000 offices across the country to remotely access Web applications on the company's intranet.

IBM, which last October licensed Ashley Laurent's baseline IPSec implementation, now plans to integrate the Internet Name Space and Topology Information Exchange technologies across its products, including routers and the OS/390 and AIX operating systems.

To convince the IETF to adopt this new version of IPSec, IBM will need to demonstrate that it's not the only big vendor behind the technology, says Bob Moskowitz, chair of the IETF's IPSec Working Group.

"There are about six different projects floating around, including one from TimeStep, that also deal with IPSec systems configuration," he says. ■

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Briefs

■ **IBM** *has announced it will sell thousands of its* **Network Station thin clients** *to Sysco and American General Finance.*

IBM *has two new Network Station customers.*

Both companies will use the devices to replace dumb terminals. Network Stations are designed to access Unix and NT applications running on networked servers. Pricing for Network Station starts at $499.

■ **Allied Telesyn** *is now shipping LAN switches that comply with the* **IEEE 802.1q virtual LAN standard.** *Two of the company's Ethernet switches support 802.1q for VLAN tagging, security and port trunking. The AT-3700XL switches include one device that features 24 10Base-T ports, one 10/100Base-TX port and an optional 100M bit/sec port uplink. The second switch has 16 10Base-T ports, a single 10/100 Base-TX uplink and an optional 100Base-TX port. These switches cost $1,154 and $999, respectively.*

✆ Allied Telesyn: (408) 730-0950

■ *A group of former* **Novell** *engineers operating under the name* **Timpanogas Research Group (TRG)** *is gearing up for the release of its first rendition of a* **NetWare** *file system that runs on top of Windows NT. Called FENRIS, the product is designed to provide better interoperability between NetWare and NT servers sitting on the same network. FENRIS supports all of the features of Novell's existing file systems. FENRIS will be available in the second quarter.*

✆ TRG: (801) 2229129

Pentium II servers get a boost

By Deni Connor

A slew of server vendors last week rushed to pledge support for Intel's latest Pentium II Xeon processor, which includes a new 450-MHz chipset designed to boost server performance up to 20%.

The processor upgrade, first expected last fall, is being embraced by Compaq, Dell, Hewlett-Packard and a host of other server suppliers (see graphic).

The companies plan to plug the 450-MHz processor into new and existing servers. The servers will include up to four of the processing engines and will compete with Reduced Instruction Set Computing machines. Pricing for servers based on the new processors starts at about $7,000, but high-end models can double that figure.

The new servers could address the needs of users whose large database and transaction processing applications have hit bottlenecks on networks anchored by servers using Intel's 400-MHz Pentium II Xeon chips.

While Intel claims performance improvements of up to 20%, server vendors are a bit more modest. HP, for example, has seen improvements of up to 13% on servers running Windows NT Server 4.0 and Microsoft's SQL Server 7.0 database. An HP Netserver using Intel's 450NX chipset handled 23,000 transactions per minute in a Transaction Processing Council benchmark test.

The 450NX chipset features up to 2M bytes of Level 2 cache — high-speed memory that keeps often-used data and instructions ready for access by CPUs. Intel's 400-MHz chipset maxed out at 256K bytes of Level 2 cache. The new chipset also supports 8G bytes of RAM, which is twice as much as the 400-MHz version.

"Increased cache usually results in higher performance," says Richard Fichera, vice president of research at Giga Information Group in Boston. "It is not always a linear relationship, and it depends on the application. Applications that display quasi-regular access patterns, such as some databases, benefit from increased cache."

One user plans to make sure that all servers his company buys include the 450NX chipset.

"Layer 2 cache is one of Intel's most important [technologies]," says Charles Shepard, senior systems engineer for the Mirage Resorts in Las Vegas. "Layer 2 cache increases the performance of database and Windows 2000 applications significantly."

Later this quarter, Intel is expected to announce a Xeon boost to 500 MHz. ■

SERVER VENDORS RALLY AROUND NEW INTEL CHIP

Here's a sampling of the servers supporting Intel's new 450-MHz Pentium II Xeon processor:

Vendor	Server model	Base price	Available
Compaq	ProLiant 5500, 6000, 6500, 7000	$7,159	Now
Data General	AV25000 NUMA, AV3700 and 8700	$7,000	Now
Dell	PowerEdge 6300, 6350	$8,418	Now
HP	LH4	$9,650	Feb. 1
	LXr8000	$11,300	Feb. 1
Toshiba	Magnia 7000	$7,945	Now
Unisys	QR/2, QS/2, QR/2V, QS/2V	$10,895	Jan. 30

Virus threatens NT nets

Microsoft, Network Associates team on fix.

By Christine Burns

Windows NT administrators should be on the lookout for a new strain of computer virus that can wreak havoc on their networks.

Referred to as the Remote Explorer virus, this malicious mobile code encrypts executable, text and HTML files on NT systems, rendering the files unreadable.

Remote Explorer is the first of a new class of virus that can readily move across networks to take advantage of connected systems, says Peter Watkins, general manager of Network Associates' security group. Unlike typical virus strains, Remote Explorer can transport itself from one networked machine to another without the user's help. Most strains require the user to accidentally pass a virus along as an executable program on a floppy disk or download it from the Internet, Watkins says.

Remote Explorer targets NT Server and NT Workstation machines by tapping into NT's remote administration feature. Windows 95/98 and Unix machines can carry the virus, but they can't become infected.

When a local administrator runs an infected executable, the virus uses the administrator's privileges to install itself as an NT service. The service uses the administrator's privileges to infect executables across the network. When the infected executable file is transported to a new machine, the virus starts the infection process anew.

Administrators can check for the virus by opening the "Services" applet in the NT Control Panel. If Remote Explorer is listed as a service, it means the machine is infected.

Microsoft is collaborating with Network Associates to build detection software and a fix for the virus. This software is available from Network Associates' Web site at www.nai.com.

The first known case of the virus was detected late last month by MCI WorldCom. The virus reportedly spread to 10 of the company's sites and affected several thousand NT servers and workstations. Watkins says no subsequent infections have been reported. ■

Compaq launches low-end ProLiant

By Deni Connor
Houston

Compaq last week introduced its least expensive ProLiant server to date.

The entry-level ProLiant 400 runs on Pentium II 350-, 400- and 450-MHz processors. Pricing for the new server starts as low as $1,471.

The ProLiant 400 features 512K of Level 2 cache, and its RAM is expandable to 384M bytes.

The ProLiant 400 *breaks the sub-$1,500 barrier.*

The server comes equipped with a 10/100M bit/sec Ethernet adapter, six expansion slots and up to 27.3G bytes of disk capacity.

The server comes packaged with Compaq's server management software, as well as SmartStart, which automates installation and setup. ■

WIRED WINDOWS

Why 1999 will be the Year of the Directory

Expect to hear about Year 2000 issues ad nauseum between now and year-end. Here in Austin, Texas, it was the front page headline in the first Sunday paper of the year. Don't expect to read a lot about it in "Wired Windows," however — unless something really startling happens.

As mentioned in my last column of 1998 (*NW*, Dec. 21, page 22), I expect 1999 to be remembered as the Year of the Directory, the year in which directory-centric computing becomes the norm, not just for business computing, but also for personal and recreational computing.

All the major directory vendors (Novell, Sun, Netscape and, later this year, Microsoft) will vastly improve the speed, scope and ease-of-access of their products.

More importantly, though, there will be simpler and more secure integration and synchronization across directories, as well as better directory identity for every object on the network. This thanks to the work of the Lightweight Directory Access Protocol and Directory Enabled Network groups.

Even the Year 2000 problem (OK, I mentioned it — but this is important) will be helped by the move to directory-centric computing. As you move to new directory-enabled applications, you'll get Year 2000 compliance in the bargain.

Dave Kearns

Easier administration for you, easier access for your users, better control of users and the devices they use, Year 2000 compliance — the benefits of directory-centric computing are compelling. Forward thinking network administrators who haven't already done so should immerse themselves in the process of understanding the directory, its uses and its possibilities.

These are the administrators who'll be in high demand during the next few years because they truly will be able to do more with less; they'll have more control and ease-of-use while spending less on manpower, training and travel.

We can enjoy smaller IS departments and reduce our training budgets as computer-based training, presented as a directory-centric application, replaces the much more costly use of outside training facilities.

Adaptive bandwidth, controlled through the directory, will bring online meetings and conferencing to more enterprises, cutting travel budgets and the loss of productivity that travel causes. Proactive troubleshooting with directory-based network monitoring software will reduce downtime and thus enhance productivity.

You get all of these benefits, and yet your job is easier. You become a hero to the chief financial officer, the CEO and the end users while enhancing your value to both your current company and the one you move to next. Keep reading "Wired Windows" and the rest of *Network World*, and we'll tell you how.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

While I've refrained from tooting my own horn in this column over the years, I'd be remiss if I didn't point out that I'm the co-author of The Complete Guide to NDS, *published by Sybex (ISBN# 0782118232). Throughout the year, I'll also recommend other books, articles and white papers that will help you understand directory-centric computing and its benefits. Watch this space!*

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Briefs

■ **OpenConnect Systems** *last week announced* **SNA Print Server for CIP** *(Cisco's Channel Interface Processor), which lets tn3270 users print mainframe data from a central dedicated print server. Cisco's CIP directly links the firm's Series 7000 and 7500 routers to the mainframe. Previously, remote Cisco tn3270 server users had to install and configure individual print gateways to print off the host. Users can now access and print mainframe data off any printer in an enterprise net, and IS staffs have a single point of management for print operations.*

SNA Print Server software runs on IBM AIX, Sun Solaris or Hewlett Packard HP-UX servers linked to the CIP router, and can handle up to 1,500 print sessions simultaneously. SNA Print Server software is available for $1,995, and it costs an additional $150 per printer.

✆ OpenConnect: (972) 484-5200

■ **FlowWise Networks** *recently rolled out a* **switch that provides failover and backup** *for its routers. Called AutoGuard, the switch directs traffic to bypass a FlowWise IMS 800 or IMS 1600 Router Accelerator and connects all links directly to a backbone router. This lets a network administrator replace the 800 or 1600 without network disruption, FlowWise says.*

AutoGuard costs $2,500 and is available now.

✆ FlowWise: (408) 474-0385

■ *Former modem powerhouse* **Hayes** *last week laid off approximately 250 employees in the U.S. and Asia/Pacific region and said it had* **"effectively ceased operating."**

The company filed for bankruptcy court protection on Oct. 9, 1998, and hoped to refinance or sell the company.

✆ Hayes: (770) 840-9200

In-Site: *Lessons from leading users*

ATM answered the call for Mentor Graphics

By Tim Greene
Wilsonville, Ore.

Mentor Graphics' network operations staff is faced with a unique situation: squeezing more out of its "old" ATM net.

The company installed a private ATM network two years ago to solve one major problem: File transfers by Mentor's software engineering staff consistently clogged the company's 56K bit/sec private-line network, preventing the sales force from accessing its interactive applications.

"The priority was: Make that stop," says Thomas Magee, Mentor's network operations manager.

Mentor Graphics' *Magee says the company's ATM net saves it at least $50,000 per month in voice costs.*

Because the firm was an early adopter of ATM WAN technology, it had to take the hardware available at the time, and that resulted in an overbuilt net that is not only bulletproof, but may be even bombproof, Magee says. If Mentor's backbone were built today, many of the 18 Nortel Networks ATM switches and 20 Nortel PBXs in the net could be replaced with smaller, less expensive models.

Rather than swap out the older, larger switches, Mentor made better use of the backbone's power and ability to support mixed voice and data nets.

Magee knows that at least $50,000 per month has been cut off voice expenses because the company recently directed all interoffice traffic over the private ATM net rather than the public phone network.

Also, an internal 800 number used to access a centralized voice mail system has been discontinued because most of the voice mail is handled by one PBX connected to the ATM net. On the voice side, the company recently upgraded its dumb key systems to PBXs in all offices to allow direct inward dialing so customers can more easily reach sales staff. The PBXs also support call detail recording that can better control phone costs.

The net boosts backbone bandwidth from 56K bit/sec to 1.5M bit/sec, and branch-office trunks from 56K bit/sec to 256K bit/sec. The increased bandwidth solved the logjam problem and has allowed room for ever-increasing data traffic over the net.

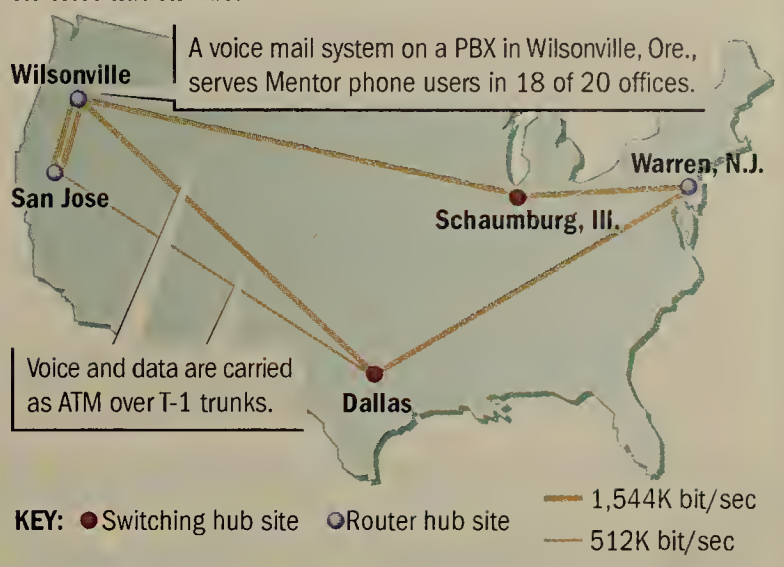
The ATM switches also allow for more efficient use of the net by diverting traffic around congested links. That redirection means more traffic can be added without buying larger private lines between sites.

The $3.2 million that Mentor spent on the initial overhaul included rebuilding its voice and data nets. But because features have been added that were not in the original network, it is impossible to quantify return on investment for the project, Magee says. ■

KATHLEEN KING

A WAN FOR VOICE AND DATA

Mentor Graphics uses ATM to share voice and data traffic among its sites nationwide.



Argon Networks scales router smarts

By Jim Duffy
Littleton, Mass.

Gigabit router start-up Argon Networks is taking the Internet scalability issue beyond bandwidth to the brain of the backbone.

Argon last week touted the route processing capability of its yet-to-be-released GigaPacket Node (GPN) router, which the firm claims has the optimal horsepower for handling Internet peering and virtual private network deployment. For end users, scalable processing may mean more reliable Internet service, Argon claims.

The control shelf component of Argon's GPN performs all route calculations and processing for Border Gateway Protocol 4 (BGP4), Open Shortest Path First and Multiprotocol Label Switching (MPLS) circuit assignments.

Argon says the GPN control shelf architecture allows users to scale processing to manage thousands of BGP4 sessions and up to eight million MPLS label assignments.

Conversely, Cisco Internet routers and those from other start-ups may not have enough horsepower to support future BGP4 peering requirements or reliable enterprise-to-Internet connectivity, Argon claims.

For now, Argon's control shelf architecture is unique, analysts say.

But GPN won't be generally available until mid-1999, so Cisco and other start-ups may have time to respond. "They may not have to rearchitect everything, but they're going to have to crank up processors or put in a second processor," says Bob Bellman, principal at Brooktrail Research in Natick, Mass. ■

INTERNETWORKING MONITOR

Next Generation Internet Forum takes the application view of QoS

The Next Generation Internet (NGI) Forum is off to a fine start. Last month, 50 delegates gathered at Argonne National Laboratories for the first official NGI Forum Information Exchange. Attending the event were business, government and education representatives, as well as network equipment vendors, application suppliers and service providers.

Not surprisingly, a common theme throughout the day was quality of service (QoS). Like most net managers, members of the NGI Forum are spending a fair bit of time grappling with the mechanics of various QoS initiatives, such as the Internet Engineering Task Force's Differentiated Services (DiffServ), IEEE 802.1p and the QoS Alliance.

Where the NGI Forum differs from most groups is that it wants to discuss QoS in terms of NGI application requirements. Ultimately, unless next-generation networks can meet the technical requirements of next-generation applications, deployment will not be possible.

While most of us tend to fixate on guaranteed bandwidth when we discuss QoS, keynote speaker Rick Stevens, Argonne's deputy associate laboratory director for physical research, and director of the mathematics and computer science division, advised the audience not to stop there. Extremely low latency is just as important as every bit of bandwidth.

Kevin Tolly

Stevens' work in building interactive, virtual environments at Argonne has established that guaranteed low latency will be mandatory if sophisticated applications are to run in real time across the NGI.

And whatever the bandwidth and latency guarantees, NGI managers need to know that providers are delivering as promised, which brings us to service-level agreements (SLA). While individual providers are still trying to figure out how to prove compliance with single-provider SLAs, NGI managers are, quite rightly, concerned about SLAs that cross provider boundaries. After all, unless the bandwidth and latency are within thresholds end to end, there is little point in deploying an advanced application.

Ultimately, managers believe the NGI needs to achieve utility status in which there is no degradation of service when crossing among domains of different service providers.

All of this leads to the agenda for the next NGI Forum meeting scheduled for mid-March. (See www.ngiforum.org for final dates and location, to join the mailing list, or to join the organization.)

At this meeting, we hope to hear from representatives of the key groups attempting to provide the framework for QoS. A member of the DiffServ committee has already volunteered to update us on that effort.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300, ktolly@tolly.com or www.tolly.com.

SPECIAL FOCUS

Managing the enterprise

CIM-plifying net management

Common Information Model tools could change the way enterprises are administered.

By Jeff Caruso

Network managers have never had an easy job, but management tools aren't helping as much as they could.

Management packages have no standard method of storing management data, critics point out. The packages don't fully take advantage of Web technology, and existing tools don't make it easy to translate business policies directly into network device configurations.

To address these complaints, vendors are putting together the Common Information Model (CIM). The CIM specification will define a standard way to represent management information. But if vendors follow through with their implementation of CIM, the model also has the potential to change the way network management is done.

Management tools could use CIM to describe all kinds of management data, including data from networks and systems. For example, a CIM database could hold information about network devices that has been gathered by using SNMP, as well as information about systems collected from the Desktop Management Interface (DMI). DMI defines PC hardware and software components in a standard fashion. This way, management tools could go to one place for all information.

Coupled with Extensible Markup Language (XML), CIM could become a way to share management data using Web technology. Add policies to it, and CIM could become a tool to set quality-of-service (QoS) levels in routers and switches throughout an enterprise.

"There are no silver bullets, but this is a step in the right direction," says Stephen Elliot, senior analyst at Cahners In-Stat Group in Newton, Mass. As companies start to merge voice onto their data networks, CIM will become more important, he says, because companies will need tools that can look at both system and network performance, as well as guarantee that voice gets the QoS level it needs.

Stealth technology

Although users will benefit from CIM, most won't see it firsthand. Because it is primarily a way for management tools to talk to each other behind the scenes, users don't know much about it.

"Our exposure to CIM is limited to the papers we've seen presented at conferences about what it looks like and how wonderful it's going to be," says Scott Parker, chief technical officer at Southernview Technologies, a Marietta, Ga., consulting firm and user of management software. "I hope it's all true, but we'll withhold judgment on it until we see what it can do."

Ironically, it will take pressure from users to get vendors to fully embrace CIM, industry watchers say. Users need to demand that their vendors share information, says Steve Joyce, vice president of marketing at Ganymede Software in Research Triangle Park, N.C., a developer of performance management software.

Without users' goading, there's not much incentive for vendors to share information, he points out. Vendors today could share data through a platform such as OpenView, but "it just turns out that not many vendors look at others' data," Joyce says.

Vendors would rather have management tools discover network information of their own products, to be on the safe side, he says. Unfortunately, this means that each tool polls the network and maintains its own database, resulting in a lot of redundant work.

Things are looking up

However, other industry watchers point to recent endorsements of CIM by Microsoft and Cisco as proof that CIM will be used heavily. In September, Cisco announced that its CiscoWorks2000 suite of management applications will exchange data with more than 20 vendors using CIM. Microsoft plans to ship a CIM object manager in Windows 2000 to act as a go-between for management applications and the operating system's management kernel.

Widespread use of CIM probably will take root about a year after Windows 2000 is released, says J.P. Corriveau, senior vice president of advanced technology at Computer Associates in Islandia, N.Y. Meanwhile, vendors likely will start to use CIM in isolated cases in conjunction with XML, he says.

Last August, the Desktop Management Task Force (DMTF) specified how to represent CIM data in an XML document. XML is a way of representing structured data, much like HTML is a way of describing a text document.

The next step for the DMTF is to specify how to get information from and put information into a CIM database using XML. The group plans to finish that specification by March.

The DMTF is also working to make policy-based management a part of CIM. The Internet Engineering Task Force and the DMTF are considering identical proposals for a standard way of describing policies, says Jim Turner, chair of the Web-Based Enterprise Management (WBEM) working group in the DMTF. No schedule has been set for standardizing the proposals, he says.

Once the standards are set, any kind of software that is responsible for enforcing policies can go to the CIM database to get information about those policies.

New order

Most established management vendors see CIM as simply a way to share data with other systems. The vendors maintain their proprietary databases but use CIM to extract data from other sources and put that data into their own databases.

But start-up Manage.Com in Santa Clara, Calif., has gone beyond that model, using a native CIM database as the foundation for its management software. As a start-up, any openness in the management area is beneficial, says Bob Quillan, the firm's vice president of marketing.

Each part of Manage.Com's product will be based on standards, Quillan says. By April the company will be making its CIM data available through XML and will be using Java to create agents for any platform. "Java is mobile code, while XML is mobile data," Quillan says. "There's so much power and flexibility in that model." ■

NEW LINGO

Network and systems management are about to be changed by several factors coming together:

CIM: A common format to store management data from any source, such as desktop systems and network devices.

XML: A language for representing structured data using Web technology. The DMTF recently released a specification for representing CIM data in an XML document.

WBEM: A multivendor initiative to provide a way for all systems to be managed through a common standard. The effort backs CIM as a standard.

DEN: A specification to store information about network devices, applications and users in central directories. The DMTF is planning to use the same model in CIM, so information will be consistent in DEN directories and CIM management systems.

SOURCE: DMTF

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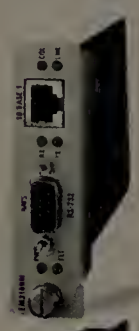
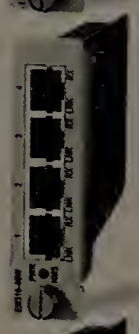
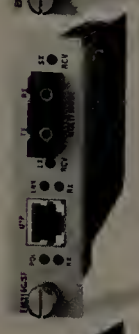


Management
SNMP Based
with Loop Back



Switching
2-Port 10/100
4-Port 10/100



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Briefs

■ *Cable Internet service provider* **@Home Networks** *last week signed a 10-year agreement with* **AT&T** *to create a* **nationwide IP network** *using AT&T's Dense Wave Division Multiplexing (DWDM) backbone.*

The new backbone, scheduled to be ready by mid-year, will be connected to @Home's existing cable network and will boost @Home's net capacity 100 fold, the company claims.

The agreement will give @Home the ability to develop new IP services and enhance its multimedia programming capabilities.

The new backbone will also help @Home more efficiently interconnect and exchange traffic with other large carriers.

✆ @Home: (415) 569-5000; AT&T: (908) 221-2000

■ **Concentric Network** *last week rolled out* **iSpeed Concentric Wireless Internet access service.**

The wireless service offers users symmetrical access to the Internet at 384K bit/sec.

Concentric is teaming with WavePath, a wireless service provider in San Francisco, to support the new service.

The service is available for $150 per month plus a one-time installation fee of $800. These charges include local access fees and customer premises equipment.

✆ Concentric: (888) 493-6232

■ **PSINet** *is boosting its network capacity by* **acquiring dark fiber** *in California and Hong Kong. The ISP, based in Herndon, Va., recently signed a deal with Metromedia Fiber Network that gives PSINet a 150-mile OC-48 loop that spans San Francisco, Silicon Valley, San Jose, Santa Clara and Haywood, Calif.*

And to beef-up its Asian presence, PSINet has acquired three ISPs — SpiderNet, HugeNet and AsiaNet — based in Hong Kong.

✆ PSINet: (703) 904-4100

Bell Atlantic angling to buy Airtouch

Acquisition would boost Bell Atlantic's wireless plans, but other suitors may prevail.

By Tim Greene
New York

Bell Atlantic hopes to establish a coast-to-coast wireless network by combining its Northeast net with the Western holdings of Airtouch Communications, a mating that would rival AT&T for cellular dominance in the U.S.

If the $45 billion deal announced last week goes through — it was uncertain at press time — Bell Atlantic would leap ahead of the other regional Bell operating companies in cellular coverage. It would also put Sprint and its national cellular designs at a distant third, according to Jonathan Haller, principal analyst at Current Analysis in Sterling, Va.

PROFILE: AIRTOUCH

Located: San Francisco
1997 revenue: $6 billion
Primary business: Wireless service provider
Founded: April 1994 as a spinoff from RBOC Pacific Telesis
Worldwide subscribers: 16.1 million
U.S. subscribers: 14 million
Assets: Cellular operations in 22 major U.S. cities; investment in Globalstar, a satellite-phone network being built; joint operator with Bell Atlantic of PrimeCo Personal Communications, a cellular service in 10 major U.S. cities; part owner of 12 international cellular ventures

Together, Bell Atlantic and Airtouch would have 13% of U.S. mobile customers, with AT&T controlling 10%. Both companies are picking up new customers so fast that the percentages could easily shift, according to Haller.

Before Bell Atlantic can close the deal, it will first have to stave off a matching offer for Airtouch from Europe's largest cellular carrier, Vodafone Group, and other offers, including one from MCI Worldcom. Bell Atlantic also faces possible trouble from the Federal Communications Commission.

While the companies involved acknowledge talks are going on, they have agreed to say nothing until a deal is final.

Bell Atlantic and Airtouch are already entwined in PrimeCo Personal Communications, a joint venture that provides cellular service in 30 U.S. cities.

The Bell Atlantic and Airtouch networks complement each other almost exactly. "There is very little overlap now in the geographic areas they cover," Haller says. And he says Airtouch is a hot property on its own. "Anecdotally, Airtouch has been blowing the doors off others in growing its subscriber base," Haller says.

If the deal goes through, Bell Atlantic would score yet another coup in its efforts to grow beyond its traditional role of local exchange carrier.

Bell Atlantic bought fellow RBOC NYNEX to capture the land-line local phone nets from Maine to Virginia, excluding Connecticut and Rhode Island networks, which are owned by SBC Communications.

In addition to digesting NYNEX, Bell Atlantic is getting ready to swallow GTE, a $53 million deal pending approval from the FCC. The GTE merger would give Bell Atlantic pockets of local land-line networks in 28 states and an extensive Internet access network. GTE would also bring enough wireless customers on its own to push Bell Atlantic past AT&T.

Because of these other deals, the purchase of Airtouch could draw heavy scrutiny from the FCC and the U.S. Department of Justice.

If successful, the deal would put Bell Atlantic on solid footing to compete against other RBOCs.

Industry observers say Bell Atlantic has a good shot at getting FCC approval to sell long-distance service in New York sometime this year. That would be the first FCC approval of an RBOC to sell long distance since passage of the Telecom Reform Act of 1996. ■

CLEC wins battle over toll-avoidance scheme

By David Rohde
Chicago

Users who employ competitive exchange carriers may benefit from a cease-fire in a Chicago war over telephone numbering.

Regional Bell operating company Ameritech last month dropped — at least for now — a legal challenge to a Chicago competitor's scheme for using the phone numbering system to quash local tolls.

The competitor, Focal Communications, offers a service called Virtual Office that establishes suburban points of presence in places where Focal does not even maintain a switch. With the service, suburban workers at home or branch offices connect to a corporate network site in downtown Chicago and use the suburban phone number instead in their communications software scripts.

The dial-up link is then transferred downtown via Focal's interconnection agreement with Ameritech. That cuts out Ameritech's per-minute user charge for all business calls between points more than eight miles apart, even within local calling areas, a cost savings for users.

Ameritech challenged Virtual Office with Illinois regulators, complaining that Focal reserved 100,000 suburban phone numbers for the service, far more than it would ever possibly use (*NW*, July 27, 1998, page 27).

Focal shot back that Ameritech's own phone-numbering policies were to blame. Under long-accepted RBOC practice, each local carrier can only order phone numbers in blocks of 10,000. That's because telco switches route to carriers based on area codes and exchanges and ignore the final four digits of the number until the local loop. Focal said it needed 10 suburban exchanges and 100,000 numbers to give it adequate geographic coverage for Virtual Office.

Ameritech decided to drop the complaint after staffers at the Illinois Commerce Commission advised Ameritech officials that numbering disputes should be settled elsewhere. Ameritech may approach one of the national industry forums that deal with phone-numbering policy, a company spokesman says.

Focal executives maintain that the phone number complaint was always a smokescreen.

"It wasn't that we were wasting phone numbers," says Dan Meldazis, Focal's manager of regulatory affairs. "The issue was whether we were providing a service that was better than Ameritech's." In a statement, Focal CEO Robert Taylor said the incident was "one more example of Ameritech opting to litigate instead of compete" but praised Ameritech for withdrawing the case. ■

EYE ON THE CARRIERS

Across the country, but not at your doorstep

For many users, 1999 will be the year they invite Qwest — the new national carrier — to bid against the Big Three telcos. Qwest is set to compete on "good old" enterprise services, such as frame relay, ATM and even circuit-switched voice and 800 numbers.

But don't look for a complete end-to-end connection from Qwest. One thing it does not have — and is not likely to have any time soon — is a plan to enter local markets.

Qwest could have taken over a germ of a local strategy from LCI International, the established carrier it acquired in mid-1998. Although LCI had not built any local networks of its own, it was reselling some services from incumbent local carriers.

In addition, LCI was active on the local-services legal front. The carrier had filed a petition with regulators to force regional Bell operating companies to improve their electronic ordering systems for local competitors. LCI also had filed a petition giving RBOCs the option to split into wholesale and retail divisions in exchange for a pass into long distance.

The force behind these moves was famed attorney Anne Bingaman. She's the former U.S. assistant attorney general who in 1995 forced Microsoft into a consent decree on marketing of operating systems. She joined LCI after her stint at the Department of Justice, but she left after Qwest acquired LCI, going into private law practice.

David Rohde

Even under Bingaman, LCI's local strategy was heavy on the legal briefs but light on usable services. After Qwest CEO Joe Nacchio came in, he made it clear that local networks weren't in his plan.

The basic problem is that real facilities-based local networks would be too hard to acquire. "We're not going to go out and buy the overvalued competitive local exchange carriers," says Ian Dix, Qwest's vice president for business-services marketing.

What's more, Qwest wants to be the RBOCs' friend. Bingaman's lobbying for the regulators to whip the RBOCs into shape has been curtailed and the legal petitions have been de-emphasized, Qwest officials concede. Instead, Qwest spent the second half of last year trying to get regulators to okay its joint marketing deals with RBOCs.

Another advocate for LCI's old approach — its long-time CEO, Brian Thompson — is also now gone. Thompson left Qwest at year-end after a term as vice chairman. "I'm a CEO," he says. "I agreed to help in the transition, but being a vice chairman is not my idea of an important assignment."

So if Qwest ever wants to start providing high-powered local connections, the company will be starting from scratch. For now, it looks like Qwest services will require RBOC T-1 access lines or whatever's available in terms of carving out local SONET connections from existing metro carriers. Don't forget to factor those into your bid process when Qwest comes to the negotiating table.

Rohde is a senior editor with Network World. *He can be reached at drohde@nww.com.*

Briefs

■ *Start-up* **App Stream, Inc.** *has released a beta version of Java streaming software designed to allow even users with dial-up modems to* **rapidly download and deploy** *large business applications and complex Java applets.*

The product, AppStream for Java, employs the same techniques used in audio and video streaming, in which programs can begin running on a client after only part of the software code has been downloaded.

App Stream's server software runs on Windows NT, Solaris and AIX platforms. A Java component automatically installs on the client the first time a user visits an AppStream-enabled site.

Founded last year, App Stream is based in New York.

✆ App Stream: (212) 983-4400

■ *Intranet software maker* **Open Text** *of Ontario, Canada, last week renewed its ongoing acquisition binge by* **snapping up LAVA Systems** *of Toronto.*

LAVA's enterprise-level integration software will allow Open Text's LiveLink Intranet software to work with products from the leading enterprise resource planning companies, Open Text says. Terms of the deal were not released.

✆ Open Text: (519) 888-7111

■ **Intelligent Environments** *has shipped* **Amazon Integrator,** *a product that helps developers craft Web applications that access legacy databases and perform terminal emulation, transaction processing and messaging.*

The $25,000 product works with IBM's DB2 database and CICS transaction software, as well as Microsoft's SQL Server.

✆ Intelligent Environments: (781) 272-9700

NT 4.0 flunks cryptography test

Another service pack fix and interoperability woes for users are the results.

By Ellen Messmer
Washington, D.C.

Last summer, Microsoft hoped to see NT 4.0 breeze through government tests of encryption features such as Data Encryption Standard and digital signatures. But things didn't go exactly as planned.

Products must pass the Federal Information Processing Standard (FIPS) 140-1 certification test before they can be sold to the U.S. and Canadian governments.

Not only did the Redmond, Wash., giant fail the cryptography tests, but Microsoft officials now acknowledge that the lab scrutiny exposed shortcomings in NT's cryptographic processing that will force Microsoft to redesign the operating system.

Microsoft expects to issue a service-pack upgrade later this year — once NT finally makes it through FIPS 140-1 testing.

"We expect this to happen early in the first quarter, but we have to allow for additional delays," says Patrick Arnold, program manager at Microsoft Federal Systems.

The Microsoft code fix, however, will prevent users who apply it from using Internet Explorer 4.0, Outlook 98 and perhaps other applications, such as the Microsoft Internet Information Server.

"Only Internet Explorer 5.0 will know how to work in FIPS mode," Arnold explains, adding Microsoft is still assessing the application interoperability problems that will result from the fix.

Microsoft has already released NT Service Pack 4, which was supposed to be the last upgrade for NT 4.0. The company has not yet announced the FIPS upgrade and has not explained whether all users — or just the ones that need the FIPS compliance — will be urged to upgrade.

The problems, which were uncovered at CygnaCom Solutions, a government-certified testing lab, are related to NT 4.0's CryptoAPIs.

Government reaction

Government users, especially the Department of Defense, which bought tens of thousands of NT 4.0 servers, are bracing for impact. "Will our department upgrade and work through the interoperability problems? Absolutely," says Dick Schaeffer, a Defense Department security manager. "FIPS 140-1 is an important benchmark that tells us an encryption module is working right."

Prodded by the Defense Department to meet government encryption standards, Microsoft insists that NT 4.0 and NT 5.0 will henceforth be designed around FIPS 140-1. And there will be only one version of NT — the FIPS version — sold to the government and commercial sectors.

Microsoft admits it might have sidestepped the interoperability mess if it had gotten into the government's test program earlier.

"We got into this a bit late," Arnold confesses. "We weren't effectively paying attention."

Late indeed. The FIPS 140-1 test program was started five years ago by the National Institute of Standards and Technology (NIST), with help from the National Security Agency.

During the past two years, the government established a vigorous test regime with three certified labs. Last year, agencies were told they had to start buying FIPS 140-1 products to protect sensitive but unclassified information.

To date, about 30 products have won FIPS 140-1 certification, including Netscape's Communicator client software and SuiteSpot server. According to NIST officials, 30 other products are undergoing testing.

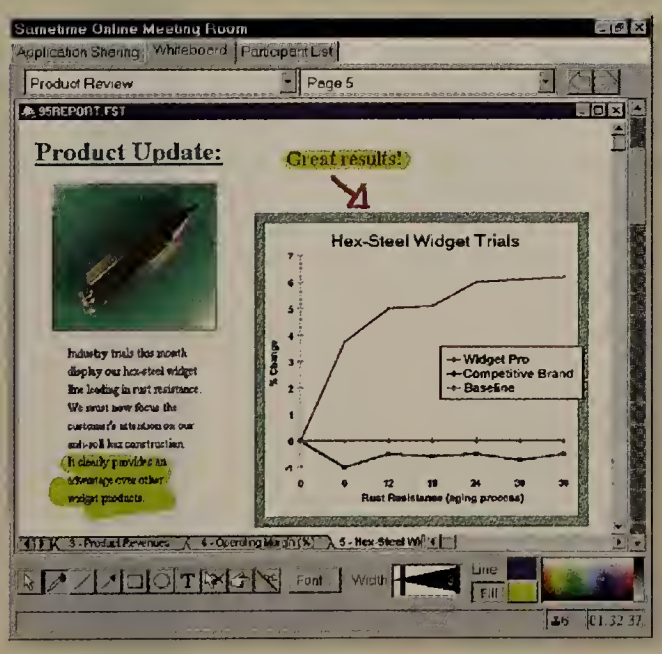
Government agencies — in theory — shouldn't be using NT to protect sensitive but unclassified information because it isn't FIPS 140-1-certified, says Miles Smid, manager of security technology at NIST.

Agencies can ask for a waiver, but the reality is that none have bothered — the lack of FIPS 140-1 products in the market seems to be excuse enough.

"FIPS 140-1 is very important, but there aren't enough products to buy," says the Defense Department's Schaeffer. ■

QUICK TAKE: SAMETIME 1.0

Lotus ships real-time collaboration product



Lotus last week began shipping new Java-based collaboration software, called Sametime 1.0. The software lets users monitor the online status of colleagues, swap instant messages, and share applications in real time. The product includes a Sametime Server, Sametime Connect Client, application development tools and Sametime-enabled templates that work with Notes 4.6 and 5.0.

Lotus is touting the synchronous collaboration capabilities of Sametime as a natural extension of the asynchronous capabilities found in Notes and Domino.

Sametime Server runs on Windows NT and can be accessed using Internet Explorer 4.0 or higher, Netscape Navigator 4.06, Notes 4.6.2 or higher, and T.120-based conferencing clients. The server costs $5,000 in addition to a $20 per-user client access license.

Lotus: (617) 577-8500

Get more online:

- **A copy of FIPS 140-1.**
- **A list of products certified as compliant.**

'NET INSIDER

A waste of good brainpower

I've noticed a disturbing trend: the emergence of papers by scholars who think they know more about how the Internet works than they actually do.

For example, *The Virginia Journal of Law and Technology* just published an article by Rob Frieden titled "Without Public Peer: The Potential Regulatory and Universal Service Consequences of Internet Balkanization" (http://vjolt.student.virginia.edu/graphics/vol3/home_art8.html). As far as I can tell, Professor Frieden's assumptions of Internet structure are wrong and negatively impact the usefulness of his conclusions.

The article looks at an important issue, the application of the universal service fund (USF) on the Internet.

Reality sometimes hurts. For example, goods and services don't cost the same everywhere. Electric power is more expensive in Boston than it is in Seattle. Gasoline is more expensive in Hawaii than it is in Texas. For most people, these are facts of life. We evaluate the various features of living someplace and decide where to live based on our priorities.

Cambridge, Mass., may not be the best place to live if I wanted to raise emus, but it is quite convenient because I work at Harvard.

This same type of disparity used to be present in telephone service because of the higher cost of wiring up customers in areas of low population density.

But since the establishment of the USF, costs to the consumer have been artificially leveled by taxing telephone customers in low-cost areas and using the funds to subsidize customers in high-cost areas.

Enter the Internet. The movement of telephone and telephonelike services to the 'Net means that regulators are starting to ask if 'Net customers should also be charged the USF tax. Some people are asking if Internet costs should also be artificially leveled using the USF because the 'Net is becoming so important.

Scott Bradner

There are real questions, and we will need answers soon. Scholarly papers on these topics are beginning to appear — unfortunately many of them, such as Frieden's, demonstrate an impressive lack of understanding of the current Internet world and thus waste the brainpower of their authors.

The misunderstandings range from not knowing that most ISPs have always been paying customers of other ISPs to not understanding how peering points such as MAE-East are run. Based on these flawed understandings, Frieden finds that the interconnection structure of the Internet is changing for the worse and implies that something should be done, such as mandating requirements for ISPs to interconnect. He then discusses some Federal Communications Commission rulings and finishes the article by arguing that ISPs should be required to pay into the USF, without actually saying so.

This is clearly a thoughtful article. Unfortunately it's not based on reality. When people such as Frieden are able to get a better understanding of the real world, these articles will become relevant, and that will be very useful.

Disclaimer: Harvard thinks it deals with reality, as do I, and the above is a reflection of my understanding.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Microsoft Certified Systems Engineer in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 7476, or send your questions to helpdesk@networkref.com.

I recently started a new job as IS director for an engineering company. One of my duties is setting up policies and procedures for the IS department and the user community.

I have worked in an executive-level position in IS before but never at a company that has no policies in place. Do you have any pointers?

Tim Thomson, IS director, Tomahawk II, San Diego

For this process to be successful, upper management will have to stand behind the policies and procedures you establish.

Use your past experience as a starting point to write the standards. You also might want to check out the *Information Systems Policies and Procedures Manual* by George Henry Jenkins, and its 1999 supplement. I found them at Amazon.com.

Remember that this will be an evolving process because of changes in technology and business practices.

Also keep in mind that the book of procedures and standards you'll be creating will only be helpful if the IS department and users follow it consistently.

A television station in Kentucky learned this lesson the hard way several years ago. It encountered a system crash only to find out that its backup tapes weren't any good.

The lesson cost the station a lot of money; it took several temporary employees nearly two months to key in the missing information while keeping up with the normal daily data entry requirements.

The station's new policy involves three sets of backup tapes, which the company creates on a daily basis and keeps in three locations.

Advanced switching boosts performance

By Bert Williams

A new breed of intelligent switching technologies that combines application session control with high-speed switching technology could help speed TCP/IP traffic.

These technologies open the door for a range of applications, giving administrators much more control over IP traffic flows and flexibility in deploying network and server resources. One technology that is being deployed in some switch software is policy-based application redirection.

Instead of merely looking at IP or media access control (MAC) address information, switches running application redirection use information from the transport layer — Layer 4 — and identify traffic by TCP port numbers and URLs.

Distributing high-performance processors across switch ports lets switches efficiently implement application redirection while maintaining high levels of resilience and throughput.

By examining information found deep in data packets, more intelligent forwarding decisions can be made about the type of traffic entering the switch and where it should be sent. Packet filters can be applied by TCP source and destination ports, IP source and destination addresses, or protocol types. Administrators then signal the switch to allow, deny or redirect incoming traffic to the appropriate egress port. Filtering rules are applied on a per-port basis, allowing extra control.

For example, filters can be specified to enable or disable caching for specific users and destination sites. Requests for sites that require IP authentication can be forwarded directly to the destination hosts, bypassing cache servers altogether. Traffic from any protocol, port number, IP address or IP address range can be redirected.

Additionally with this technology, switches can examine URL information to determine where it is best to send traffic. This feature gives net administrators new levels of IP traffic control, letting them send traffic directly to servers designed to process specific traffic types.

Identifying and redirecting application traffic within switches solves a growing problem in today's networks. These environments are being increasingly littered with discrete "network appliances," which could be servers designed to perform a specific packet-processing function, such as load balancing, bandwidth management, firewalling or caching.

Appliance products typically examine all packets and determine which are important. Caches, for example, care only about HTTP traffic. Directing only relevant HTTP traffic to caches, as opposed to making them examine all traffic, optimizes the caches.

With application redirection technology, traffic destined for firewalls, caches, virtual private network servers or other appliances could be redirected and load balanced among multiple devices.

Single points of failure are also eliminated because in the event of a failure, traffic of any type can be redirected to other available appliances performing that specific function.

Another example of application redirection involves the Domain Name Service. Proper network operation requires that subscribers' computers be configured with the correct DNS server addresses. A DNS server address that is misconfigured will result in loss of network connectivity and will generate calls to the help desk.

Problems also exist for mobile users who have their local DNS server addresses properly configured but are accessing the network outside their local points of presence. While it's desirable for a mobile subscriber to use the DNS server local to the point of presence (POP) into which they've dialed, that's not where the requests will go. Instead, DNS requests will go to the subscribers' home POP DNS servers, slowing response time.

Application redirection can solve these problems by allowing for the automatic identification and redirection of DNS requests. A mobile user's DNS requests could be intercepted by the switch at each POP and transparently redirected to the closest DNS server. Application redirection also solves the problem of misconfigured DNS addresses by redirecting all DNS requests to the DNS server of the administrator's choice, regardless of where the requests are addressed. If a user's computer has an erroneous DNS server address, it doesn't matter.

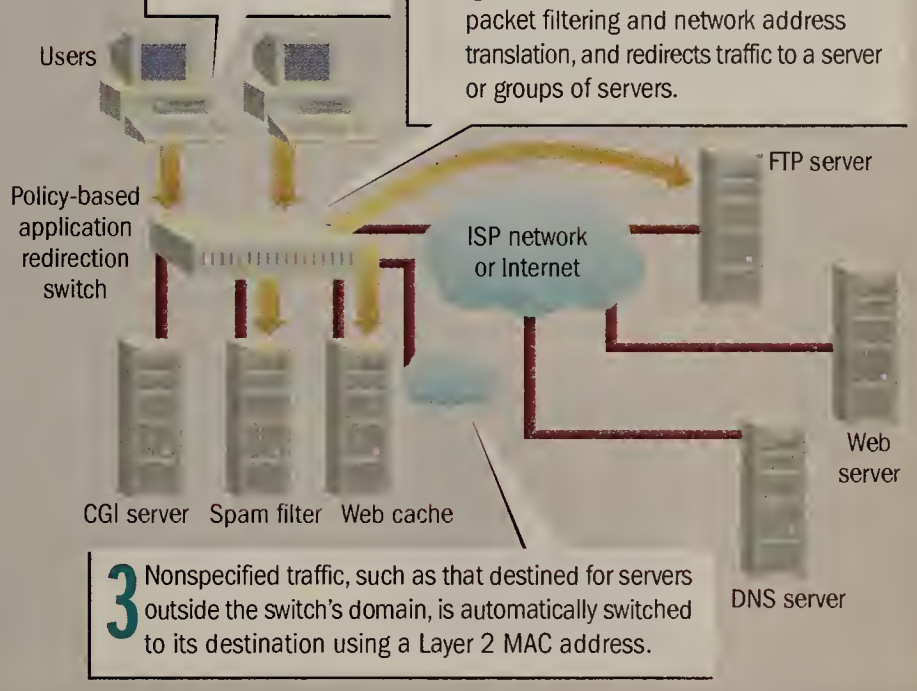
Redirection technology can also be used to identify and redirect SMTP traffic to specialized spam filters. The switch can identify SMTP traffic and redirect it to specialized servers designed to filter SMTP traffic. This reduces net bandwidth requirements and provides an automated way to eliminate spam.

Williams is the director of marketing at switch vendor Alteon Networks. He can be reached at (408) 360-5500.

HOW IT WORKS

Policy-based application redirection

Rather than looking at IP or MAC address information, switches using application redirection look to the transport layer — Layer 4 — and identify traffic by TCP port numbers and URLs. By looking at information found deep in data packets, more intelligent and efficient forwarding decisions can be made about the traffic entering the switch.



EDITORIAL *insights*

Resolve not to be comfortable in 1999

Has this happened to you? You frequent a certain restaurant, car repair shop or hair stylist. At first, you're treated like royalty — the waiters or mechanics are responsive, friendly, attentive. But over time, things change. That great service isn't so great anymore. You get the nagging feeling they're taking you for granted. You've gotten too comfortable with the status quo, and you're paying for it.

I feel this way about American Airlines. I travel a great deal, and I have a lot of AAdvantage frequent flyer miles. I have a real incentive to remain loyal. But, over the past year or so, American's service has gotten lousy, and its pricing stinks. It's difficult to get upgrades. Where I once felt special (well, better maybe), I now feel as though American is testing how far it can push customers like me before we break our allegiance. It's too bad because my company won't pay the inflated rates and I'm building up my United miles.

Now admit it, you feel this way about some of your key network vendors. They won you over, they handled you with kid gloves at first, but now you're yesterday's news.

Don't put up with it! Resolve not to let yourself get comfortable with any vendor — or to let them get comfortable with you. New technologies and new competitors give you the opportunity to shock entrenched suppliers into offering better service and pricing. Here's a sample:

- If Cisco dominates your LAN, sample switching technology from, say, Lucent, Nortel or Extreme. New Layer 3 boxes from companies like those can offer outstanding price/performance. Make sure to put the devices where your Cisco rep can see them.
- Call up Qwest, which is hot for your WAN business. Your MCI WorldCom or AT&T rep is going to get a lot more attentive if you mention that you had a nice lunch with that fella over at Qwest.
- Even if you love NT — sorry, Windows 2000 — bring Linux in for a pilot and ask your Microsoft liaison or your dealer about integration tools. You might also want to tell your NT supplier that you like the fact that Novell Directory Services is a cross-platform solution, where the promised Active Directory isn't.

The point is simple. You need to deliver the best service to your customers — the end users — and to do that, you need to get the best possible service you can from your suppliers. Don't get comfortable. Make them work hard for your business in 1999.

Oh, and try a new place for lunch.

John Gallant, editor in chief jgallant@nww.com

Totally Unplugged • Ira Brodsky

High-speed access race will leave ILECs in the dust

Today's Internet is just a prototype of tomorrow's. The next killer app could be IP telephony, PC-based videoconferencing, remote access to Star Trek Voyager's holodeck or something else. Whatever it is, it's going to require ubiquitous high-speed access.

The dial-up modem has reached its evolutionary dead end. Modulation magicians have stretched their art to its limit. The 56K bit/sec modem is to multimedia what the 110 bit/sec modem was to full-screen text: it's just not good enough.

The incumbent local exchange carriers (ILEC) tell us not to worry. They claim asymmetric digital subscriber line (ADSL) technology will breathe new life into their copper wires. A circuit that previously supported one telephone will soon accommodate one telephone plus a 1M bit/sec data channel. Best of all, the International Telecommunication Union (ITU) has published an official plug-and-play ADSL standard, G.Lite. Hmmm. Isn't the ITU the same outfit that bet on the Open Systems Interconnection protocol over TCP/IP?

Waiting for ILECs to deploy new technology is like waiting for Godot. I remember when I first heard ISDN would soon bury analog modems. That was 20 years ago. Now, some ILECs say ISDN is an excellent interim solution while we wait for ADSL. Great, I'll let my grandkids know — as soon as they're born.

There are other reasons to be skeptical. For starters, ADSL may not work over 50% of the approximately 177 million local access lines in the U.S. Even if ADSL makes it to the homes of some 12 million telecommuters, it stands a good chance of being snuffed out by lousy premises wiring. And some ILECs may be dragging their feet on ADSL because they don't want to undermine T-1 sales.

Yep, the Telecommunications Act of 1996 sure led everyone astray. The only way to create competitive local markets, legislators wrote, is to force ILECs to unbundle their corroded copper networks. It never occurred to them that real competition requires competing infrastructures. Pundits laughed at the thought of cable TV operators selling voice and data services. But guess what? Facing competition from direct broadcast satellite companies, cable TV operators are actually upgrading to hybrid fiber-coax. They are also cooperating with third parties such as @Home, and no act of Congress was required.

There are a couple other things the cable TV industry has going for it. It already possesses a massive broadband network, with 450 MHz of bandwidth (upgradable to 1,000 MHz) serving more than 73 million subscribers. And unlike the ILECs, most cable TV operators can still remember their humble, entrepreneurial beginnings.

Wireless operators are busting into local access markets with high-speed offerings, too. New service providers such as Teligent are hurting ILECs where it counts: in the mid-size business market. Employing cost-effective, point-to-multipoint technology, these operators can extend fiberlike services to tens of thousands of office buildings. What they need to be competitive is not access to ILECs' networks, but to office buildings' rooftops.

The myth of local markets being locked in the ILECs' iron grip is shattered by the more than 60 million cellular and personal communications services subscribers. If anyone has an unfair advantage, it's wireless telephone operators. Awash with capacity, many now offer end-to-end digital services over invisible local loops. Plus, the wireless telephone industry is committed to developing third-generation solutions supporting speeds up to 2M bit/sec.

Look for cable and wireless operators to make bandwidth-on-demand, always-on connectivity and mobility the rule rather than the exception. And look for ILECs to talk about the virtues of "working with somebody you know" — as their customers steadily defect to the competition.

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Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

Sonic boom

We at Sonic Systems are pleased that you chose to spotlight our product in your review, "Tiny firewalls fill a niche" (Nov. 30, 1998, page 49). However, we have some concerns about the testing methodology.

Our SonicWALL Plus is intended for small network applications such as single-site professional offices, branch offices or schools. In our customer base of more than 4,000 companies, SonicWALL Plus is used between a 10M bit/sec WAN router and a 10M or 100M bit/sec LAN. In the

Old guard must adapt to new-age messaging

The three kings of enterprise messaging — Lotus, Microsoft and Novell — are looking more and more like clueless bystanders in this new age of carrier-grade messaging services.

ISPs have become the primary e-mail providers for consumers and small businesses, as well as for a growing number of larger enterprises that are not averse to outsourcing their e-mail infrastructures to save a buck. The day will soon arrive when more e-mail boxes are hosted by ISPs than in-house enterprise messaging systems.

Who's supplying the world's ISPs with standards-based messaging infrastructures? It's not the Big Three. Few ISPs are seriously considering using the proprietary-based messaging/groupware products of Lotus, Microsoft or Novell to support their customer bases. The primary products underlying today's ISP-based messaging systems include Netscape's Messaging Server Hosted Edition, Sun's Internet Mail Server and Software.com's InterMail. What these carrier-grade messaging products have that the enterprise-oriented wares lack are Internet standards-based architectures and scalability to support ever-growing numbers of users per mail server.

These are serious vulnerabilities for Lotus, Microsoft and Novell. Scalability is the ticket to continued success in the enterprise messaging market, as well as in the burgeoning ISP market. Now that multivendor interoperability is taken more or less for granted, the focus of competition in the messaging market has shifted to scalability. How much message traffic, how many users, and how many gigabytes of messages and attachments can be supported on a single enterprise mail server? Consolidation of the messaging infrastructure is an important issue in controlling total cost of ownership.

Under these circumstances, outsourcing enterprise messaging to ISPs grows even more attractive. Wouldn't it be more cost-effective to outsource the messaging infrastructure to third-party service providers that can exploit scale economies of deployment and administration outside the capabilities of many enterprises?

To date, attempts by old-line enterprise messaging vendors to scale up for the new marketplace have been a tad pathetic. Lotus and Microsoft claim that the latest versions of their respective products can support 50,000 to 60,000 Post Office Protocol 3 (POP3) users per server. That's much better than their historical ceiling of 1,000 users per server, using the vendors' respective proprietary client software, but still a far cry from the hundreds of thousands of POP3 users per server that Netscape and others claim to support.

On the scalability front, what's holding Lotus, Microsoft and Novell back is their traditional focus on the enterprise groupware market. Groupware traditionally has been viewed as a bundle of related collaboration services geared to small to mid-size workgroups and accessed from integrated client applications, such as Lotus Notes and Microsoft Outlook. Groupware vendors have supported client/server access to messaging, calendaring, document management and other services through proprietary Remote Procedure Calls (RPC). Proprietary RPCs allow vendors to tweak network access, security and replication parameters common to all bundled services.

Until the advent of carrier-grade messaging rivals, groupware vendors had little incentive to scale up their proprietary RPCs to support more than 1,000 users per server. After all, the Big Three make a sizable chunk of money licensing their software on a per-server basis and have little to gain by allowing users to load more and more mailboxes on fewer physical servers. The companies also fear that by diluting or abandoning their proprietary RPCs, they will be unable to define any unique value added for their proprietary groupware client applications.

Meanwhile, carrier-grade messaging vendors eschew proprietary RPCs, optimizing their products to operate over commodity standards such as HTTP, Simple Mail Transfer Protocol and POP3. What the products generally lack in groupware functionality (and this is not an inherent deficit, as Netscape's SuiteSpot proves), they make up in scalability and the ability to work with almost any third-party browser or mail client. And what they lack in proprietary groupware client software (again, Netscape is an exception) is no skin off their competitive noses. Customers increasingly are comfortable with the idea of accessing all network services from their Web browsers or from two or more stand-alone, standards-based clients adapted to messaging, calendaring, newsgroups and other collaborative services.

Lotus, Microsoft and Novell still rule the roost in the enterprise messaging/groupware market. However, they will continue to lose collective market share to their standards-based rivals until they can address the scalability issue convincingly. Most likely, they will follow Netscape's lead and reposition their products into two parallel products for the enterprise and ISP markets.

Proprietary-based architectures will continue to live in the enterprise messaging market, but in an ever-narrowing niche. Users want a single enterprise messaging infrastructure that can be deployed internally and externally with trading partners. That infrastructure will have to be built on open standards.

Kobielus is an Alexandria, Va.-based analyst with The Burton Group, an IT advisory service that provides in-depth technology analysis for network planners. He can be reached at (703) 924-6224 or jkobielus@tbg.com.

review, however, SonicWALL Plus was used between two 100M bit/sec segments, a scenario for which the product is not designed. Granted, this functionality is available in other products in the market, but at a significantly higher cost. (Sonic Systems will be addressing this functionality issue with a new product to be released in February.)

A possible explanation for the performance problems the reviewer faced is his use of a 10Base-T hub to adapt the 10M bit/sec Ethernet port on SonicWALL Plus to work with the 100Base-T LAN. If the 100Base-T LAN had more than 10M bit/sec of traffic on it, a 10M bit/sec hub would get swamped.

Additionally, Global Technology Associates' GNAT product, which was also featured in the review, was tested with 100M bit/sec adapters in the host PC, which is not a uniform comparison with the way SonicWALL Plus was tested. The use of adapters and a PC also adds significant cost to GNAT's $1,000 base price.

If the reviewer had used SonicWALL Plus for its intended application and had a consistent testing methodology, we think the outcome would have been significantly more positive.

Sreekanth Ravi
President and CEO
Sonic Systems
Santa Clara, Calif.

Editor's note: After readers and Sonic Systems raised questions about the low level of SonicWALL Plus' performance, we took a look at a different SonicWALL Plus unit. This time, SonicWALL Plus exhibited none of the throughput drains we experienced with our first unit, despite a similar setup and connection through daisy-chained hubs. Our re-evaluation suggests SonicWALL Plus is a good candidate for small and mid-size networks looking for firewall functionality and bulletproof security in a relatively easy-to-use package.

Get real

Your article, "Are you paying too much?" (Nov. 30, page 33) creates some unrealistic expectations for readers regarding benchmark rates for basic telecom services.

The article gives readers the impression that they are failing if they are not paying 4 cents per minute for dedicated traffic. If inTelesystems President David Bower, who is quoted in the article, is getting those dedicated rates for his clients, I applaud him. However, these rates are not appearing in the contracts the Big Three carriers are filing with the Federal Communications Commission.

While pricing in renegotiated contracts has fallen, tariffed pricing has continued to increase. The only way most corporations can achieve lower rates is by renegotiating their contracts. For the Big Three, a three-year term contract is the standard. For a corporation under such a contract, it is virtually impossible to get a rate anywhere near 4 cents per minute.

Tim Hanson
President
Teleplus Consulting
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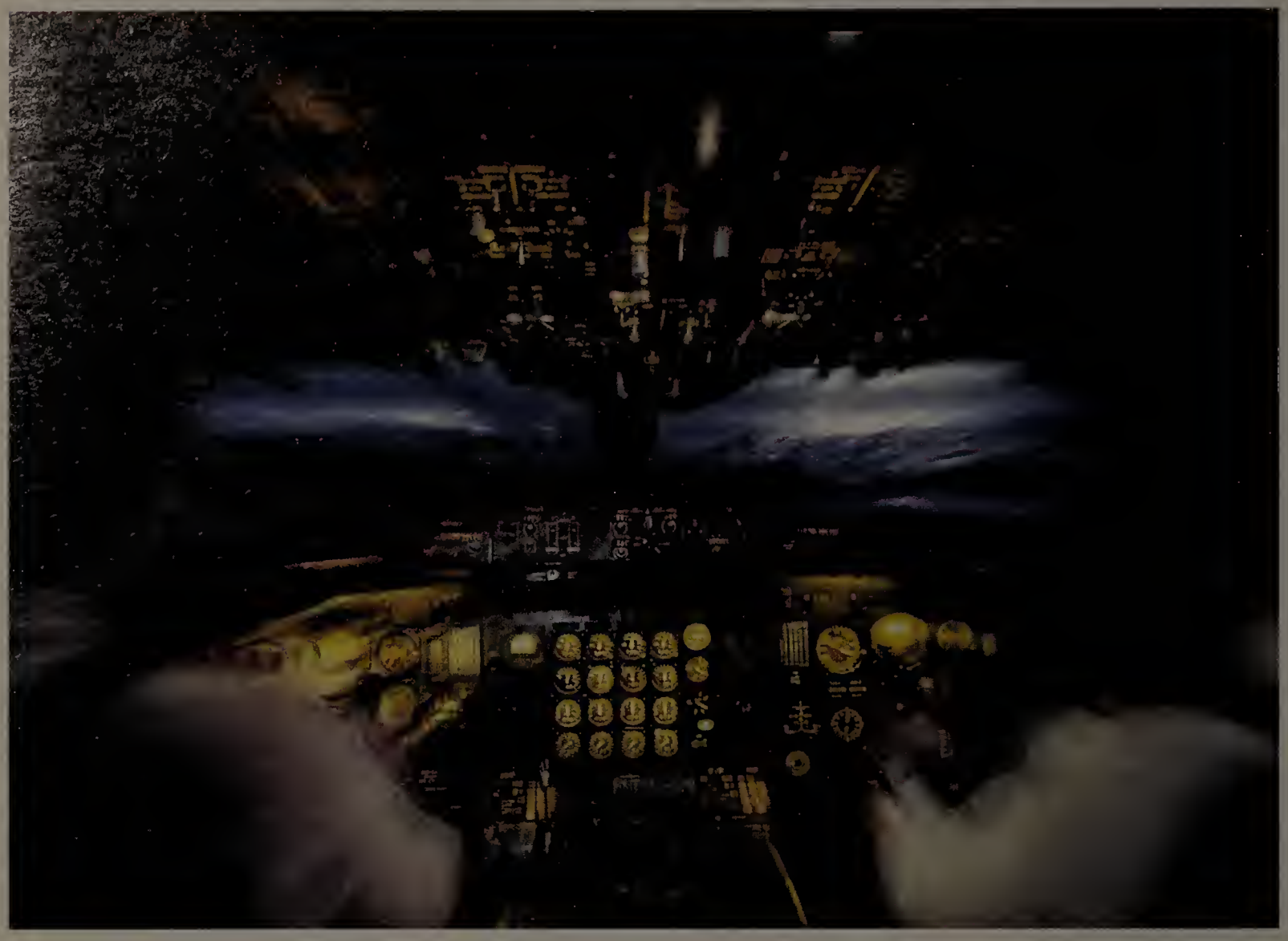

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FEATURE

Striking back

Corporate vigilantes go on the offensive to hunt down hackers.

Get more online:

- **The story behind the Pentagon's response to the Electronic Disturbance Theater's attack.**
- **A link to the author's security portal, Infowar.com.**
- **More information on Secure Computing's Sidewinder security server and security products from Internet Security Systems.**

nwfusion

Continued from page 1

One end of the opinion spectrum says law enforcement agencies are generally not up to the task, so corporations have a fiduciary responsibility to protect their interests. The only question for these companies is how far they are willing to go. Will they break laws, and if so, which ones?

The opposite view is corporate vigilantism is wrong: Taking the law into one's own hands only makes things worse.

The First Vigilante Corp.

Lou Cipher (a pseudonym of his choice) is a senior security manager at one of the country's largest financial institutions. "There's not a chance in hell of us going to law enforcement with a hacker incident," he says. "They can't be trusted to do anything about it, so it's up to us to protect ourselves."

Cipher's firm has taken self-protection to the extreme. "We have the right to self-help — and yes, it's vigilantism," he says. "We are drawing a line in the sand, and if any of these dweebs cross it, we are going to protect ourselves."

Cipher says his group has management approval to do "whatever it takes" to protect his firm's corporate network and its assets.

"We have actually gotten on a plane and visited the physical location where the attacks began. We've broken in, stolen the computers and left a note: 'See how it feels?' " On one occasion, he says: "We had to resort to baseball bats. That's what these punks will understand. Then word gets around, and we're left alone. That's all we want, to be left alone."

A senior vice president of security at a major global financial firm speaks of the matter in military terms. He equates a hacker intrusion to a "first strike," and says defense is an appropriate response. "If you use measures to restore your services, that's defense, not offense," he says. When asked how far his company goes, he concedes only, "I am willing to defend myself."

"We had to resort to baseball bats. That's what these punks will understand. Then word gets around and we're left alone. That's all we want. To be left alone."

A senior security manager at a large financial institution.

In interviews with dozens of companies, a surprising number are seriously considering implementing "strike-back" capabilities. However, when asked, most companies would not admit they have already taken such steps.

Bruce Lobree, an internal security consultant at a major financial institution, is cautious about admitting his firm uses vigilante activities and strike-back techniques. He says with a smile, "I can't answer yes or no. That's proprietary. Besides, legally we can't. But I can tell you that everything that occurs at our network perimeter and inside our networks is recorded."

A recent study, "Corporate America's Competitive Edge," conducted by Warroom Research, a competitive intelligence firm in Annapolis, Md., shows that 32% of the 320 surveyed Fortune 500 companies have installed counteroffensive software. Warroom President Mark Gembecki notes that not every company will send out thugs to enforce their firewall policies. Cyber-response is OK, he says, but Cipher's physical retaliation is "a clear and overt violation of civil rights."

Such extreme counteroffensive methods raise the hackle of even the staunchest corporate information warrior. Lloyd Reese, program manager of information assurance for Troy Systems, a technical support company in Fairfax, Va., has a criminal justice background and says physical response is illegal and "doomed to failure." Such responses will only invite further attacks — perhaps even more intense, he says. "Companies need to follow the appropriate legal process. We already have chaos on the Internet, why should we make it worse?"

Joseph Broghamer, information assurance lead for the U.S. Navy's Office of the Chief Information Officer, goes further, saying even the Pentagon shouldn't have done what it did. "Offensive information warfare is not a good thing . . . period. You want to block, not punish," he says. "There is no technical reason to react offensively to a hacker attack." His opinion is shared by precious few.

As part of its information security practice, Ernst & Young has been asked about strike-back capabilities and how hostile perimeters might be used for defense. Dan Woolley, national leader of market development for the firm, says he knows of "companies in finance, insurance and manufacturing that are developing and deploying the capability to aggressively defend their networks." He is quick to point out, however, "We don't do it for ourselves even though we are attacked regularly."

The questions security software vendors and consultancies like Ernst & Young are now grappling with are wrenching: Should they develop offensive software, offer it to their clients, deploy it and support it? And if so, how open should they be about it?

How they do it

It's easy to understand why companies are interested in the idea of corporate vigilantism. Even the best layers of defense — firewalls, passwords and access control lists — can't work alone for many reasons. Among them:

- Network topology, users and software are constantly changing. There is no way to keep up.
- New vulnerabilities are found — and exploited — daily.

STAN BAROUGH

"Offensive information warfare is not a good thing . . . period. You want to block, not punish," says Joseph Broghamer, information assurance lead for the U.S. Navy's Office of the Chief Information Officer.

■ A small number of individuals with little technical skill can launch massive online attacks.

Once an attack is detected, corporate vigilantes have various methods of evening the score.

The Navy's Broghamer argues that sometimes the best response to an attack is to shut down the network connection altogether, although he acknowledges the Navy is not as sensitive to uptime and customer perception as the private sector.

Another approach is to send a strongly worded message to the source IP address or to an ISP in the path. Traceroute is a tool that can identify source IP addresses. But you have to get the assistance of ISPs down the line to trace additional hops on the Internet, because each hop has to be covered in order to find the real source. That's all legal, but you may need to pressure the ISP into working with you quickly to identify the next hop in the chain. Once you collect this data, it can be handed over to law enforcement officials — who may or may not react.

In 1994, Secure Computing, a security vendor in Roseville, Minn., introduced Sidewinder, a novel firewall with strike-back capabilities. If it senses an attack, it launches a daemon that will trigger the offensive techniques of your choice. Other companies indicate they will soon be offering a range of strike-back products.

A company crosses the line when it responds by unleashing a denial-of-service attack against an intruder, as the Pentagon did. This can be done via massive e-mail spamming, the Ping of Death and hostile Java applets.

No matter what offensive mechanism you choose, the trick is to identify the culprit before returning fire. Should you fail to recognize that the attacker spoofed the identity of another company, you may find yourself attacking J.C. Penney, NBC or General Motors. Innocent companies would not take kindly to that sort of activity — no matter the reason — and ISPs don't appreciate being the vehicle for Internet-based attacks.

Indeed, one of the big dangers with corporate vigilantism is how easy it is to overreact to an apparent attack. In spring 1997, one of the Big Six accounting firms used scanning tools from Internet Security Systems (ISS) to assess the security of a major ISP that controlled a huge amount of Internet traffic. When a network administrator on duty at the ISP noticed a thousand simultaneous connections to his firewall, he reacted quickly and shut down several routers. "His manual reaction took down 75% of the Internet," says Tom Noonan, president of ISS. "Anyone using Sprint at that time was in a world of hurt."

MICHAEL A. SCHWARZ

"[An ISP net administrator's] manual reaction took down 75% of the Internet. Anyone using Sprint at that time was in a world of hurt," says Tom Noonan, president of Internet Security Systems.

Even those with a strong inclination for vigilantism note that counteroffensive responses are fraught with danger. "Talk to your lawyers," Troy Systems' Reese advises. "Keep in mind that your strike back has to go through a long path, and you might do damage at any place along the way." Retribution can cause a hair-trigger response that could cause damage to systems in the path from you to the attacker.

"You really have to understand what you're doing," says Ray Kaplan, a senior information security consultant with Secure Computing. "Your first response might invite further attack, exactly the opposite of what you intended. You have to consider your firm's public relations posture and how the Internet community as a whole will react to your actions."

Don't ask, don't tell

As for how law enforcement will view vigilantism, the answer from many companies is a resounding, "Who cares?"

Vigilantism is emerging as a response to the intense frustration people feel with law enforcement authorities they view as simply not up to snuff. Complaints from top firms in the U.S. range from downright ineffectiveness ("clueless" is an oft-repeated word) to a lack of staff, lack of funding, courts that are too crowded with cases and the snail-like speed at which typical law enforcement investigations run.

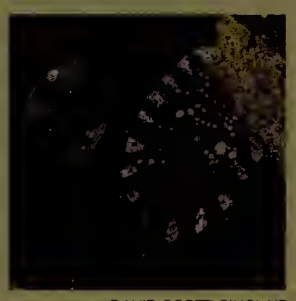
"One reason you see vigilantism is because law enforcement doesn't get the job done," says Fred Cohen, president of Fred Cohen and Associates and principal scientist at Sandia National Laboratories. "Law enforcement might investigate if you have a lot of political clout and you do all of the leg work."

Companies are also fearful of what might happen if they do bring in law enforcement. "It's a hell of a situation when victim companies are more fearful of the FBI than they are of the

Guidelines for would-be corporate vigilantes

There are many ways to detect break-ins and a variety of options on how to proceed once you do. Here's a collection of insights from dozens of users, analysts and vendors on the techniques that work best.

■ Use quality detection systems. You want to detect miscreant insider behavior as well as external hacking. Host-based auditing, network behavior statistics and traffic analysis are all good sources of security-related data that can alert you to abnormalities that may indicate a security incident. Keep in mind that intrusion detection systems (IDS) are all a little different. Some excel in NT, others in Unix or Novell, and some pick up anomalies and events that others don't. It's a good idea to use more than one IDS.



DAVID SCOTT SINCLAIR

■ Determine your first course of action once you detect an incident. Many people suggest isolating the source into a specific, noncritical part of your network. Others say cutting off the source of the attack is all they want to do. Your reaction should reflect your corporate security policy.

■ Let your legal department know what's going on. If you ever have to get law enforcement authorities involved, you want to ensure you've taken the right steps. If your in-house counsel doesn't know how to proceed, strongly suggest he get advice from an experienced cyberattorney.

■ Collect all systems logs from firewalls, routers and servers so you can identify what tools the attacker used and which of your vulnerabilities were exploited if you cut off the attack. Act upon this knowledge and reconfigure accordingly.

■ Make sure all your auditing tools are active if you don't cut off the attack. You may want to increase the tools' sensitivity to capture more data points. Monitor the intruder's actions closely, so you can cut off the attack at any time you choose.

■ Consider the use of forensic tools, especially if you have an insider hacking at your systems. Forensic tools will allow you to perform a sector backup of the suspect's hard disk with cryptographic seals to prevent tampering and assist in maintaining a quality chain of evidence. In addition, you may need to search the suspect's hard disk and floppies (including Zip drives and the like) for erased files and other hidden attributes. Don't forget to involve human resources personnel; they can keep you out of a heap of trouble.

■ Attempt to trace the source of the attack. This is not easy, and often involves a lot of people with different organizations. Know whom to call at your ISP in the event of a breach. Be able to reach your contact 24-7 in case of an after-hours attack. ISPs coordinate with each other in many cases, and if you plan for the eventuality, you will be ahead of the game and able to react much faster.

■ Have a game plan, especially if you call in law enforcement, which is more restricted in its ability and legal right to gather evidence than your company. Get legal advice regarding proper investigative techniques and evidence gathering so they will hold up in court. Recognize that investigative procedures and techniques can be disrupting, causing downtime and a drain in manpower.

■ Strike back if you choose, but only with adequate legal counsel. There is a range of actions you can take — some more offensive than others (see sidebar, page 35).

■ Prepare for the acts of man as much as for acts of God. Your disaster recovery people can handle floods, earthquakes and tornadoes. But can they handle a hacker?

— *Winn Schwartau*

attackers," says Michael Vlahos, senior fellow at the U.S. Internet Council. He echoes the worry that sensitive corporate information will not be protected if handed over to law enforcement.

"Law enforcement is helpless," ISS's Noonan maintains. "It's not like Israeli fighters who train every day for every contingency. Conventional law enforcement just can't match the skills needed. Besides, you can't trust law enforcement to keep your secrets from becoming public knowledge."

Predictably, law enforcement does not favor the vigilante view — at least publicly. "If someone were to attack us, we are not encouraged to swat back," says Lt. Chris Malinowski of the New York Police Department, who specializes in cybercrime. "If companies take any of these proactive defensive steps, they are taking a big chance, subject to criminal prosecution."

Dave Green, deputy chief of the Computer Crimes and Intellectual Property Section for the U.S. Department of Justice, says he relates to the frustration over law enforcement's inability to respond, but adds that his department can only recommend protective measures. Yet he stops short of advising against corporate vigilantism outright. When asked if companies should hack back at attackers, Green responds, "no comment," as he does to questions as to what could legally be considered an attack. "But I can say that law enforcement is gearing up and is much better equipped to deal with cybercrime," he adds.

Asked if companies should hack back at attackers, the Justice Department's Green responds, "no comment."

When they are not speaking for attribution, law enforcement authorities of all stripes go further than Green. Local police, state police, the FBI, Secret Service, Interpol and Scotland Yard members all say the same thing — unofficially: "We can't handle the problem. It's too big. If you take care of things yourself, we will look in the other direction. Just be careful."

Security consultant Lobree seems to understand the police mentality and applies the red light theory to cybervigilantism. "Suppose it's the dead of night on a country road, and you come upon a stop light. You can see for miles in all directions. Are you going to run the light even knowing there is virtually no chance of being caught?" Some, perhaps most, won't, because they have an innate fear of being caught. Others will forge ahead. "A lot of companies recognize that the chance of getting caught in a vigilante cyberstrike is pretty darn low," he says.

It's your call

A number of sources suggest vigilantism might be a business opportunity for a firm that wants to specialize in counteroffensive network security. "In the 1860s, law enforcement was conducted by Pinkerton, a private company," Vlahos says. Many suggest that privatization should be the case in the cyberworld as well. The kind of offensive network security products needed to make it happen are starting to find their way into corporate tool kits and onto the Internet.

But the legal challenges that coexist with hostile perimeters and counteroffensive measures are daunting. The astute company will examine every aspect of its posture before marching down the slippery slope of vigilantism. Sometimes the best defense is not to overreact. In the worst case, do nothing until a proper response can be developed.

Vlahos says courts may be the place to create new laws more attuned to the technology. "This is a whole new arena, and I don't know how we can explore it without trying new approaches, even if they are technically illegal."

"One reason you see vigilantism is because law enforcement doesn't get the job done."

Fred Cohen,
president of Fred Cohen and Associates and principal scientist at Sandia National Laboratories.

Cipher, the baseball-bat-bearing vigilante, is all for new approaches. "Personal persuasion is always more effective than electronic persuasion," he says. "Personal persuasion virtually guarantees that a hacker will see the error of his ways, scamper to please and turn over a new leaf."

No matter what path you choose, make sure it is well thought out and that you have your legal ducks in a row. You just might need them.

Schwartau is chief operating officer of The Security Experts, a global security consulting firm, and president of infowar.com. He can be contacted at winn@infowar.com.

Tools of the trade: Killer apps at the hostile perimeter

"Killer app" used to mean an application everyone agreed was a must-have. Now the term can also mean a program used to counter attacks on your network and establish hostile perimeters. For companies that choose to employ such tactics, there is a range of options.

Passive data collecting. Learn everything you can about the source of the attack. Study the local audit logs from servers, and use programs such as traceroute to identify the intruder.


DAVID SCOTT SINCLAIR

Nasty notes. Sometimes all it takes to make the bad guys go away is an e-mail message or Java script sent to the source IP address with a warning such as: "You have been found trespassing on my company's computers and networks. This is a felonious criminal offense. We now know who you are. If we find you here again, we will hand over all our systems logs to law enforcement, and prosecute you to the fullest extent of the law."

Alert the ISPs along a hacker's trail. You can send ISPs connected to the trail a message like the following: "We have found that your company is in the path of offensive hacking against my company. Here is the information we have collected so far." ISPs are loathe to have their networks part of any criminal activity and will likely do what they can to help.

Browser interrupters. Because so many attacks are now browser-based, returning hostile Java applets and other code to the source attack browser can be debilitating to the attacker. The code behind FloodNet was released on Jan. 1 as public freeware. The program asks a target machine's search engine to repeatedly conduct searches, a request that eats up bandwidth and CPU cycles. It's a slick way to strike back at an attacker if you know his IP address. It's also illegal.

Denial of service. Just as an attacker can do this to you, you can return the favor. Denial-of-service attacks can overload WAN links, CPUs or otherwise disable a network. However, be aware of possible repercussions to any systems between you and the hacker. Taking down an ISP, no matter how accidental or well-intentioned, is not a smart move.

Bandwidth and e-mail flooding. If you know the IP address of your attacker, you can respond with an e-mail flood to his server to mitigate the effects of the attack. The legality of this is questionable, so it's a good idea to get legal advice first.

Back Orifice. Back Orifice programs, such as D.I.R.T. and Netbus, are Trojan horse programs sent to a hacker's machine. Depending on the exact features of the program, the target machine broadcasts all keystrokes, screen shots and system activities back to a "home base" IP address — one you can monitor. Such attacks are not always successful, but if you're lucky, you get to monitor your attacker's every move as he makes it.

Deception. This amounts to lying to your adversary at your hostile perimeter. Entice attackers into a honey pot in which you buy time to garner additional information on his actions. Make your servers and perimeter services look as if they're full of more holes and vulnerabilities than they really are by running daemons whose sole purpose is to occupy the time and energy of the attacker. Tie up the resources and time of the attacker while you engage in data collection, tracing and other identification techniques.

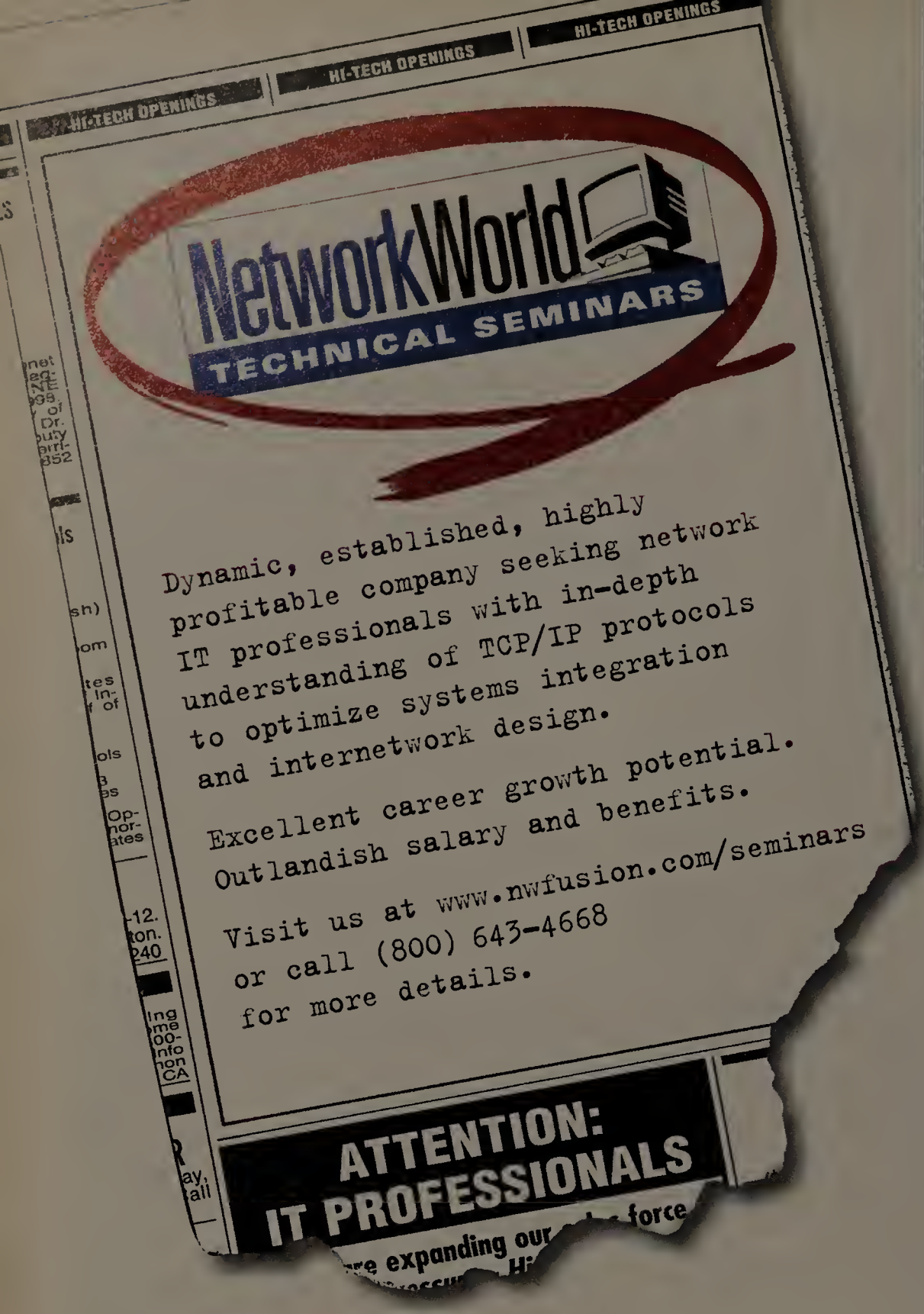
Ping of Death. Ping of Death attack codes can shut down servers, routers and other network devices. They can be highly effective but are also illegal. If you know the IP address, using Ping of Death is an option, but you have to be careful not to take down innocent electronic bystanders.

Over the top. We found two cases in which intruder's legs met a baseball bat swung at high speed. The companies in question suddenly experienced an extraordinary drop in external hacking. We hope you don't need to be reminded how illegal this is.

No matter what your corporate policy dictates, one point cannot be stressed enough: Get legal counsel involved in your plans. You could, quite innocently and in defense of your own company and its networks, become a criminal yourself. That is not a good career move.

Be careful out there.

— *Winn Schwartau*



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PROGRAM OVERVIEW

TCP/IP has become the standard you must be well versed in if you work in an Internet- or intranet-centric environment. An in-depth and clear comprehension of TCP/IP is essential for network administrators, analysts and PC support staff who need to understand the practical applications of this ubiquitous protocol — not just the theory behind it.

Understanding TCP/IP: **Implementing the Protocols of the Internet**, an information-packed, 2-day program, is an invaluable educational tool that will help you understand the Internet protocols (TCP and IP) as well as important Application protocols. The use of over 15 case studies, captured from live internetworks, will demonstrate analytical techniques to help you solve typical problems.

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This seminar will give you the opportunity to:

- Learn how TCP/IP is supported in various host and LAN operating systems
- Study the functions of the supporting protocols, such as ARP, RARP, DNS, BOOTP, RIP and OSPF
- Understand how IP-based routing works
- Learn how you can integrate the application protocols, such as TFTP, FTP, TELNET, SMTP and HTTP into a TCP/IP environment
- Understand the operation of SNMP, the Internet standard for network management

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PRODUCTS of the YEAR

The top 10 of 1998

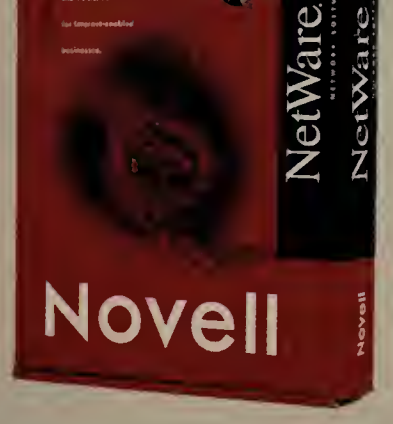
Among the best products we looked at, NetWare 5 stands out.

By Lee Schlesinger, Ann Sullivan and the Network World Test Alliance

In 1998, John Glenn returned to space, Jerry Seinfeld resumed his private life and *Network World* reviewed more than 140 products, 10 of which we deemed to be World Class.

The 10 products that won our World Class Award, which goes to any product that scores 9 or better on our Score Card, cover a range of technologies. Many are network management products — not surprising because in response to reader demand we focus a lot of our review efforts in that area. Also among the World Class are three servers, a network modeling tool, two security products and a network operating system. Some are new, and some are new releases of existing products.

After looking over this year's winners, we picked the most ambitious product with the broadest scope as our Product of the Year — NetWare 5.



PRODUCT OF THE YEAR

NetWare 5: reviewed Sept. 7
Novell
(801) 861-7000, (800) 638-9273
www.novell.com

NetWare 5 includes more fundamental changes to the operating system than any previous upgrade. Among the improvements are better administrator tools and easier client connections and logon. A new file system mounts huge volumes almost instantly; and the system's complete transition to pure IP network transport works seamlessly. One caveat: The just-barely-hatched ConsoleOne management interface is slow and limited in function.

"Users won't see the new network protocol, memory management improvements, upgraded file system and graphical administration interface, but managers will rejoice at Novell's continued improvement of a rock-solid network operating system."

— James Gaskin, Network World Test Alliance

Modeling, monitoring and administration

NetMaker XA: reviewed Feb. 23
Make Systems
(650) 941-9800
www.makesystems.com

Make Systems' NetMaker XA is a network modeling and simulation package that lets you measure the effect of network changes before you make them. Intended for large networks, the product delivers top-notch performance and a huge set of add-ons, including vendor-specific device libraries. There's also a helpful disaster recovery planning option.

"The simulation engine in Make Systems' NetMaker XA is one of the most powerful you'll find, and is just one of the things that makes the product a thoroughbred. Everything we tried worked the way it is supposed to."

— Tom Stearns

Config Central 2.0: reviewed Jan. 19
NetPro Computing
(800) 998-5090
www.netpro.com

Config Central makes it quick and easy to outfit your NetWare servers with the latest NetWare Loadable Modules. It also simplifies the management of the many versions of software drivers on your servers. Among Config Central's strong points are a flexible scheduling function, rollback capability and easy installation. And with Config Central, you can automatically undo changes across multiple servers.

Unfortunately, in this version, you can't designate groups of servers to be updated together. Also missing is a macro or scripting feature that would let you execute frequently performed tasks with a single mouse click. Late last year, NetPro released Config Central 3.0, which we hope to review in a future issue.

"By allowing you to take a proactive approach to server management, Config Central keeps your network healthier with less unplanned downtime."

— Dennis Williams, Network World Test Alliance

PRODUCTS of the YEAR

VitalSuite 2.0: reviewed Nov. 2
INSoft, formerly VitalSigns Software
(408) 980-8844
www.vitalsigns.com

VitalSuite 2.0 is a diagnostic tool kit that gives you a clear view of network activity, helping you pinpoint problems. The server and client software are easy to install and are backed by superb documentation. A comprehensive set of charts and reports presents data with an impressive amount of detail.

"As soon as we installed VitalSuite, identifying overloaded servers, slow Domain Name System responses, missing Web pages and bogged-down client CPUs was easy."

— Bob Currier, Network World Test Alliance

Enterprise Administrator: reviewed May 18
Mission Critical Software
(888) 323-6768
www.missioncritical.com/EA/EA.htm

If you need help managing distributed NT domains, consider Mission Critical Software's Enterprise Administrator. It lets you assign administrative permissions to select users on a limited basis, giving them the ability to perform tasks normally relegated to domain administrators. Enterprise Administrator is exceptionally easy to use, relying on a hierarchy of marshal-deputy-user to distinguish users. It delivers a versatile command set and menu options.

"Microsoft offers no native tools for assigning [limited administrative] permissions, but we found products from three companies that do offer these tools. Mission Critical Software's Enterprise Administrator tops the list, winning our World Class Award on the strength of its effectiveness, documentation and superb technical support."

— Jeff Bankston

Client security

Full Control 1.5: reviewed Aug. 3
Bardon Data Systems
(510) 526-8470
www.bardon.com/fullctl.htm

Bardon Data Systems scored big with its first version of Full Control. A security tool for Windows 95 and 98 clients, Full Control lets administrators specify what programs can be run by whom and how long users are allowed to stay logged on. Full Control also monitors and logs all Web browser activity, locks out questionable sites and generates several excellent usage reports.

"Full Control is an excellent tool at any price and an amazing value at $49.95 per workstation. Its ease of installation, incredible number of configuration options and the unobtrusive way in which it works make it a must-have for anyone who manages Windows 95 and 98 workstations."

— Bob Currier, Network World Test Alliance

SAF/nt 2.0: reviewed Aug. 24
The National Registry, Inc.
(813) 636-0099
www.saflink.com

The National Registry, Inc.'s Secure Authentication Facility for NT (SAF/nt) supports the Human Authentication API, allowing you to use multiple biometric authentication methods, including fingerprint, voice and face recognition.

We tested voice verification, which relies on ITT Industries' SpeakerKey biometric technology. SAF/nt's most impressive feature is its seamless integration with Windows NT administration utilities and the NT client logon procedure.

"For a primarily NT shop that wants to go with biometric authentication, SAF/nt provides a level of integration with NT far above any other product we reviewed. If most of the machines in your company have sound cards, as do most sold in the past couple of years, SAF/nt's voice authentication can be an inexpensive biometric option."

— John C.C. Duksta

Pentium II workgroup servers

Dell PowerEdge 2300: reviewed June 15
Dell
(800) 999-3355
www.dell.com/products/poweredge/pe2300

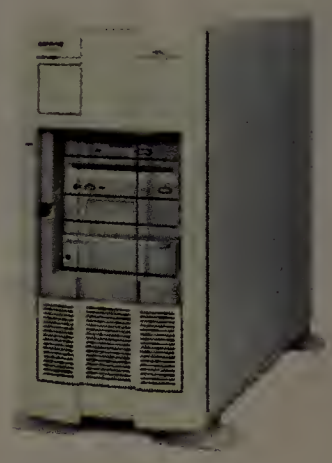
Dell's PowerEdge 2300 delivers the whole package. While it offered good performance, the PowerEdge 2300 caught our attention because of its strong serviceability, features, flexibility and manageability.

Dell's bundled management tools enable administrators to manage one PowerEdge server from another PowerEdge server, as well as administer a server from remote locations. Additionally, Dell's management bundle includes software that works with certain server hardware components to simplify management of Windows NT and NetWare servers.

"One of the strongest points of serviceability for the Dell server is that it can be disassembled without any tools. The drives are in hot-swap bays, the processors are secured with thumb screws, the cards are secured with plastic flip tabs instead of screws, and the case can be opened with thumb screws."

— John Bass, Network World Test Alliance

Compaq ProLiant 1600: reviewed Dec. 14
Compaq
(800) 888-0220
www.compaq.com/products/servers/proliant1600



Exceptional performance is the hallmark of the ProLiant 1600, which aced our Web and file tests thanks to its extremely efficient SCSI controller and network interface card drivers. It also scored well in our SQL test. Solid management and serviceability features distinguish the ProLiant 1600, whose modular case can be disassembled for easy access to hard-to-reach components.

"The server's management features are similar to those of Compaq's high-end servers. Compaq Insight Manager integrates with many management platforms, including HP OpenView, Sun NetManager and Tivoli TME 10 Netview, and provides early detection of possible hardware failure. An Automatic Server Recovery feature gives the server the ability to reboot itself when necessary according to conditions configured by an administrator."

— John Bass, Network World Test Alliance

IBM Netfinity 5000: reviewed Dec. 14
IBM
(800) 426-7255
www5.pc.ibm.com/us/products.nsf/$wwwoveseries/Netfinity+5000

Super serviceability distinguishes the Netfinity 5000, which proved easy to service and troubleshoot and fared well in our performance tests. The case features a toolless design that does not use any screws. Everything comes apart with levers, which makes the unit a breeze to disassemble and reassemble.

"The server uses strategically placed LEDs on the motherboard to mark failed dual in-line memory modules, CPUs, fans and other components. This light path diagnostic feature could save a lot of time in troubleshooting bad components."

— John Bass, Network World Test Alliance

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- **Our perspective on trends of the past year.**

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NetworkWorld

ComNet/DC '99 Planner

Since its creation in 1977, ComNet has been one of the best forums for network professionals to find the latest information on how to design, build and manage global enterprise networks. This year's show at Washington, D.C.'s Convention Center extends the program a step further with several new additions, including ComNet/Executive Forum, a program designed to teach business executives such as CEOs, CIOs, CFOs and COOs how to use their networks for strategic business purposes.

The amount of programs, sessions and meetings can be a bit daunting, however. So to help you make the most of your time at the show, we have sifted through the schedule to pick out the events we think will be worth your while. Read on.

EXPOSITION

VPN Proving Ground

You've heard the hype and endured the pitches, yet you still don't know which virtual private network (VPN) products and services are right for your enterprise. At ComNet/DC '99, vendors will be forced to back up their VPN claims with proof, thanks to a new expo feature. ComNet's VPN Proving Ground gives network managers a chance to view live demonstrations as vendors attempt to create secure VPN connections from a headquarters to a mock remote office in another city, state or country. The VPN Proving Ground pavilion is sponsored by The Tolly Group and Bell Atlantic, and is located at Booth 4114.

OUR PICKS

One-day Tutorial

Monday, January 25

9 a.m. to 4 p.m.

BUILDING A UNIX NETWORK SERVER IN A DAY

By the time you leave this session, you will know how to install and configure a fully operational Linux system, starting with only newly formatted disks. Craig Hunt, head of the Advanced Network Technologies Division at the National Institute of Standards and Technology, walks you through network interface configuration, basic routing installation, the installation and configuration of Domain Name System and more.

Conference Sessions

Wednesday, January 27

8 a.m. to 9:15 a.m.

FRAME RELAY VS. INTERNET VIRTUAL PRIVATE NETWORKS

For many enterprises seeking wide-area connectivity, frame relay has been the way to go. But now, network service providers are selling native IP services as an alternative, touting benefits such as reduced costs and access to any site at any time. A panel moderated by The Yankee Group's Eric Hindin looks at the pros and cons of frame relay and Internet VPNs.

11 a.m. to 12:15 p.m.

POLICY-BASED NETWORK: GODSEND OR BOONDOGGLE?

It sounds almost too good to be true: Software that allows network managers to implement and dynamically adjust (with next to no effort) security, quality of service and device configuration. A panel that includes Michael Cookish of 3Com's Network Management Division will analyze the benefits of a policy-based network and how it can work in your enterprise.

2 p.m. to 3:15 p.m.

VOICE OVER DATA TRANSPORT: FRAME RELAY, ATM AND IP

Convergence promises reduced voice communications costs, but are advanced data transport technologies such as frame relay, ATM and IP ready to deliver quality services? Panelists exploring this question include Ralph Santitoro, product manager at Nortel Networks/Micom, and Dr. Bur Goode of IBM Global Services.

Thursday, January 28

10:45 a.m. to 12 p.m.

HOW SECURE IS MY CONNECTION?

As more workers move from headquarters to remote locations, companies seeking to secure their network connections face increasingly complex challenges. A panel moderated by TeleChoice's Claudia Bacco reviews security hazards and measures for customers using digital subscriber line, wireless, cable and dial-up services.

1:45 p.m. to 3 p.m.

WHY THE RAGE ABOUT CACHING PROXIES?

Web caching proxies are expected to become a $4 billion industry. But what does it really cost to install and maintain the proxies in your enterprise? Are there problems that caching vendors aren't telling you about? A panel including Dr. Misha Rabinovich, AT&T Labs Research member, explores current products, ways to configure proxies and how to design the right caching hierarchy.

PICKS OF THE WEEK

Keynote: Network — The New Generation Comes of Age

Tuesday, 11:15 a.m. to 12:15 p.m.

STEVE BORNS

AT&T Chairman and CEO C. Michael Armstrong has a unique perspective regarding the convergence of three technologies that have helped define the Information Age — telecommunications, computing and multimedia. Armstrong will outline the opportunities and challenges that businesses face in the future.

Career Fair: A World of Opportunity

Wednesday, 10 a.m. to 5:30 p.m.

COMNET CAREER FAIR

Looking to take advantage of the next big career opportunity? Look no further than the ComNet/DC '99 Career Fair, where scores of top companies will be on hand looking for IT professionals to manage their enterprise networks. Sponsored by Network World, *the Career Fair will be held in Rooms 30 and 31 of the Convention Center.*

Keynote: Changing the Face of Telecommunications

Thursday, 9:30 a.m. to 10:30 a.m.

The spectacular growth of telecommunications has been spurred by the spread of simple data communications applications, but its future could be a feast of IP fax, IP voice and multimedia applications over the Internet. John Sidgmore, CEO of UUNET and vice chairman and chief operating officer of MCI WorldCom, offers a sneak preview of technologies to come.

Network World's FRAME RELAY SHOWDOWN

If you have ever wanted to get the plain truth about frame relay from frame relay service providers, you'll want to swing by *Network World's* ComNet/DC '99 Frame Relay Showdown. AT&T, Sprint, MCI WorldCom, Intermedia, Infonet, Qwest and US WEST have agreed to take part in this presidential-style debate.

When: Tuesday, Jan. 26, 1:30 p.m. to 2:45 p.m.
Where: Grand Ballroom, Renaissance Hotel

The speakers:

- **Joe Lueckenhoff,** product vice president for data network services, AT&T
- **Brad Hokamp,** director of advanced data services, Sprint
- **John Scarborough,** director of virtual data services, MCI WorldCom
- **Michael Johnson,** senior director of enhanced engineering, Intermedia
- **Bob Dagiau,** vice president of intranet service marketing, Infonet
- **Mack Greene,** director of frame relay and ATM product management, Qwest
- **Janice Aune,** vice president of operations, US WEST

During the debate, service provider executives will face tough questions from a panel of industry experts, including: David Rohde, a *Network World* senior editor; Steve Bell, founder of the Silicon Valley Networking Lab, a leading testing and consulting organization in San Jose; and Atul Kapoor, a network analyst with The Tolly Group in Manasquan, N.J. Companies then will have the opportunity to grill one another before fielding queries from the audience. John Gallant, *Network World's* editor in chief, will chair the debate.

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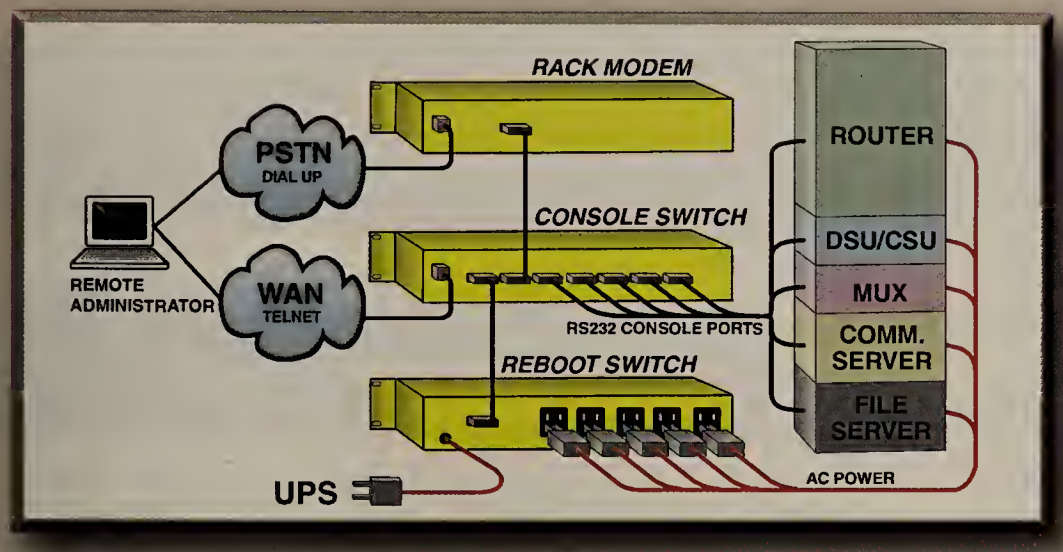
- ✔ Select Multiple Console/AUX Ports
- ✔ Reboot power on selected devices



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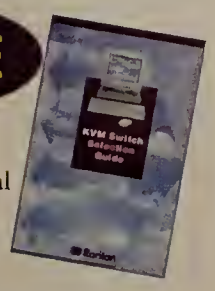

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DIRECTORY OF SERVICES

Cable & Wireless

Continued from page 1

lone, president of commercial Internet and messaging services at the domestic subsidiary of Cable & Wireless plc. This, combined with the fact that MCI customer information was slow to arrive and not necessarily accurate when it came over to Cable & Wireless, created some lack of responsiveness, he says.

Although Cable & Wireless is hiring a myriad of employees in all areas to help handle the MCI customers, the company is still considered to be the nasty new stepmother to some former internetMCI users, such as Cincom Systems.

The software company, based in Cincinnati, was trying to contact its new Cable & Wireless sales representative to talk about expanding its Internet access bandwidth, but it just kept getting bounced around, says Bill Dyer, chief information officer at Cincom.

"It took us almost two weeks to get someone to talk to us about our account," Dyer says. "When I had to start working to get a hold of someone, it was time to switch," he explains.

Cincom is now in the process of inking a two-year deal with AT&T WorldNet, which is nearly doubling Cincom's Internet bandwidth but not its monthly bill, Dyer says. AT&T's lower prices and good customer service sealed the deal for Cincom, he adds.

Dyer is not alone. Other former MCI customers have complained about the lack of customer service responses, especially when they were having technical difficulties.

Employees at Linbeck Construction in Houston could not send e-mail for nearly four weeks to any Simple Mail Transfer Protocol mail servers because of a new antispam filter that Cable & Wireless set up, says Rich Gay, director of information systems at Linbeck.

But after Gay was informed about the antispam filter, he notified Cable & Wireless that the filter was interfering with his ability to e-mail servers and, therefore, hurting his business. He told Cable & Wireless that the problem needed to be resolved ASAP. Now, nearly one month later, Gay still has not heard from the service provider, but he's no longer waiting. Last week he canceled all of his company's Cable & Wireless dial-up accounts — which amounted to between $6,000 and $10,000 annually.

It took *Cincom's Dyer two week to get Cable & Wireless on the phone.*

Complaints aside, Cable & Wireless has taken on a hefty task that could pay off in the long run. For example, handling MCI's 3,300 dedicated users, 66,000 dial-up business users, 250,000 dial-up consumers and 1,300 ISP customers is a lot to swallow, but it's not too difficult to digest, Malone says.

In the acquisition, MCI sent more than 45 sales representatives, but Cable & Wireless has acquired enough new accounts to keep 150 sales representatives busy, Malone says.

Therefore, Cable & Wireless has shifted some of its 550 sales representatives to handle the new Internet accounts. In addition to redirecting sales agents, Cable & Wireless is beefing up its customer service efforts.

"From September until now we have doubled the size of the customer service staff with 200 to 300 new people," Malone says. "In the short term, as you're training new employees they will make mistakes," he says.

Cable & Wireless says the majority of merger bumps are behind it, but the service-provider still has much work ahead, especially in the areas of

See **Cable & Wireless**, *page 52*

PROFILE: CABLE & WIRELESS USA

CEO: Dennis Matteucci

Primary business: Providing domestic and international voice, data and Internet services

Employees: More than 3,400

Revenue: $1.13 billion (fiscal year ending March 1998)

Recent claim to fame: Laying out $1.7 billion in cash for MCI's Internet business, which is more than Cable & Wireless' revenue for last year

Jini

Continued from page 1

as a consumer technology that would allow home users to connect household devices such as telephones, video players, printers and stereo systems.

But increasingly, Jini is taking on an enterprise network flavor. Several early Jini licensees are working on products for the enterprise market, with storage devices marked as an early favorite.

First product coming

Malaysian software vendor BizTone.com will be first to market with a Jini offering. The company, known as Datek until recently, late this month is slated to unveil BizTone 1.0, enterprise resource management applications that will be delivered as rentable services over the Internet.

The company will use Jini — which, like Java, is object-oriented — to distribute the applications as components that can reside anywhere on a network but function as a single system.

However, no one knows when a second Jini-enabled product will surface. Although Sun plans an "official" Jini launch on Jan. 25, most of the early licensees expected to participate in Sun's San Francisco event aren't saying exactly when they'll release products incorporating Jini.

"It will be a couple of quarters past January before Jini becomes widely used," says Ed Barron, president of Java systems integrator and Jini licensee Network Objects in Pepperell, Mass. "The whole concept of Jini doesn't catch on until you get a number of people supporting it."

Sun co-founder William Joy began developing Jini technology in 1994. Last summer, Sun made Jini source code available on its Web site and stoked the publicity flames with Jini demonstrations at the Internet World and Java Business Expo trade shows.

To hasten Jini development, Sun last month announced a Community Source Code model for licensees.

Similar to the new licensing model adopted for Java, the Jini license lets vendors use and modify Jini source code without charge and to own any innovations they create, rather than returning intellectual property rights to Sun.

Shared services

Jini consists of a small piece of Java code that links the Java Virtual Machines in every device on a network. As each device joins the network, it announces its presence and offers services to the other devices. When the devices need to perform a task, they can look up services available from other devices and use them.

Quantum Corp. of Milpitas, Calif., plans to market Jini-enabled LAN disk drives that can be plugged in to a LAN and be made immediately available for use by any computer on that network.

Another disk drive maker, Seagate Technology of Scotts Valley, Calif., also intends to Jini-enable its product line, though the company declines to discuss product specifics.

Computer Associates, a Jini licensee in Islandia, N.Y., warns that enterprises implementing Jini across large networks could face complications.

"Jini sounds wonderful if you have five things talking to each other, but if you put 50 or 100 or 1,000 devices on a network, you're going to get a mess," says Yogesh Gupta, senior vice president of product strategy for the firm. Therefore, Computer Associates plans to Jini-enable its Unicenter TNG enterprise management software.

"With Unicenter and Jini, we'll be able to recognize not only what devices can offer services, but also which is the appropriate one to offer the service to the requester," Gupta says. "That way, if someone in the United States wants to use a printer, the printing doesn't happen in Singapore."

Novell also plans to integrate Jini technology into its Novell Directory Services (NDS) software, according to product strategist Steve Holbrook.

Company engineers are working on making NDS "Jini-aware" by extending the directory's schema (basically a list of the types of network objects that can be stored in the directory) to accommodate Jini devices and open Jini connections, he says.

Novell will have to build NDS extensions that define how Jini devices and user accounts are represented in the directory tree.

Holbrook says Novell also is developing ways to manage Jini devices via NDS.

When these vendors and others partake in Sun's Jini-fest later this month, expect lots of talk not about what Jini will someday be, but about what it already is. That's just the nature of dog-and-pony shows.

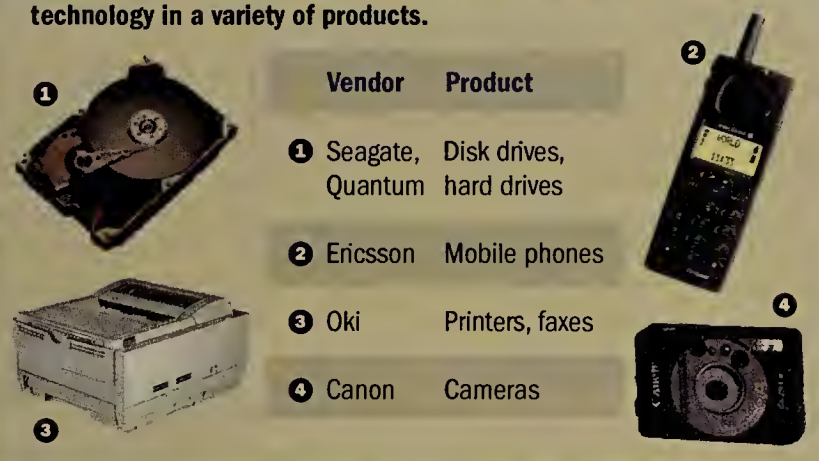
For now, though, Computer Associates' Gupta offers a reality check.

"There's not a single disk driver today that supports Jini," he says.

Senior Editor Christine Burns contributed to this story.

Where to find Jini

Early licensees of Jini plan to embed Sun's new Java-based network technology in a variety of products.



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4	Canon	Cameras

Compaq

Continued from page 1

Network and Access Communications Division, which is much reduced in size and responsibility.

Employees in the company's network product areas have been scattered to the wind. Numerous employees have received warnings of impending layoffs, and an engineering group associated with Compaq's Microcom remote communications hardware division received pink slips just before Christmas.

Employees working on switching products in Houston were told to find jobs within Compaq, transfer to Austin, Texas, or be laid off. In Austin, the site of Compaq's network adapter design and test facilities, employees were warned of impending layoffs.

Tough going

Compaq, the server and PC kingpin, has found the network ground a bit tougher to hoe than anticipated. The company so far has proven unable to develop truly standout network technology, has failed to gain the kind of mind share enjoyed by the likes of Cisco and 3Com, and ultimately has been unable to obtain the kind of share it is accustomed to in other markets.

Now, instead of tussling with the big boys, Compaq has adopted a dual-pronged approach. The first is a "burgers and fries" strategy: folks buy a PC or server — the burger — and end up adding a modem or network interface card (NIC) — the fries.

B.J. Johnson, vice president of Compaq's Network and Access Communications Division, explains that when you buy a server, you get an adapter or modem for little extra cost.

With its second approach, Compaq will use its internetwork division to provide customers with more advanced network gear. "When you sell servers and desktops, you need the infrastructure to connect them," Johnson says.

Behind the leading edge?

But Compaq, known for pushing the envelope in desktops, laptops and servers, has failed to distinguish itself in network technology, observers say. Asked what Compaq products stand at the front of their classes, Johnson cites the Digital GIGAswitch router, which it OEMs from Cabletron; the NetVantage technology, which it also OEMs from Cabletron; and Web-based Enterprise Management tools, which it is developing with Microsoft. Johnson argues that other innovative, but-as-yet-unannounced, products are on the drawing board.

While engineering expertise from its Thomas-Conrad and NetWorth acquisitions have contributed to Compaq's prowess in server adapters and hubs, no individual products stand out in the marketplace. Microcom, another acquired unit, is still growing, and Johnson argues it will contribute server-based remote access technology in the future.

Compaq's problems with innovation haven't gone unnoticed. "Compaq has some competitive products, but I can't identify any that are revolutionary," says Lee Doyle, vice president of networking at market research firm International Data Corp. in Framingham, Mass.

Many users and analysts still see Compaq as a PC and server vendor.

"We typically have been, and will continue to be, viewed as a personal computer/server computing company that has networking, storage and some other stuff," Johnson admits.

If Compaq is to establish itself as a network leader, it must have a clear business strategy. This means successfully blending in the Digital acquisition and fine-tuning a $1.1 billion deal with Cabletron to OEM internetwork products. Compaq may look to reduce the cost of the Cabletron deal, but so far Compaq and Cabletron officials have declined to comment on that possibility.

Easing up on spending

The bottom line on Compaq's reorganization is, well, the bottom line. Compaq simply does not want to spend the kind of money that a large network unit and aggressive internetwork market share growth require. "To be perfectly clear," Johnson says, "there is not a P&L business focus associated with networking anymore.

"The networking realignment here is to reduce complexity," Johnson adds. "Compaq is still going to get the same revenue from the NICs or from servers that have special communications cards in them as they would if [networking] was treated as a centralized business."

IDC's Doyle agrees.

"Compaq is certainly looking at the products on a profit-and-loss basis, but it is not looking at networking as a division anymore that is going to generate billions of dollars," he says.

R&D to decline?

Hub, switch and remote access markets are extremely competitive and require aggressive business management to be successful. Doyle questions whether those Compaq product lines will receive the research and development and the management attention they need.

Based on the reorganization, Compaq will OEM remote communications hardware rather than make its own boxes. The company's Austin facility, originally part of Thomas-Conrad, will be retained and will take over switch design and manufacturing. The Austin site will still design and manufacture NICs as well.

But rather than pursuing network company acquisitions, as it has until now, Compaq will seek partners, such as Extreme Networks and Cabletron, to fill out its network portfolio. ■

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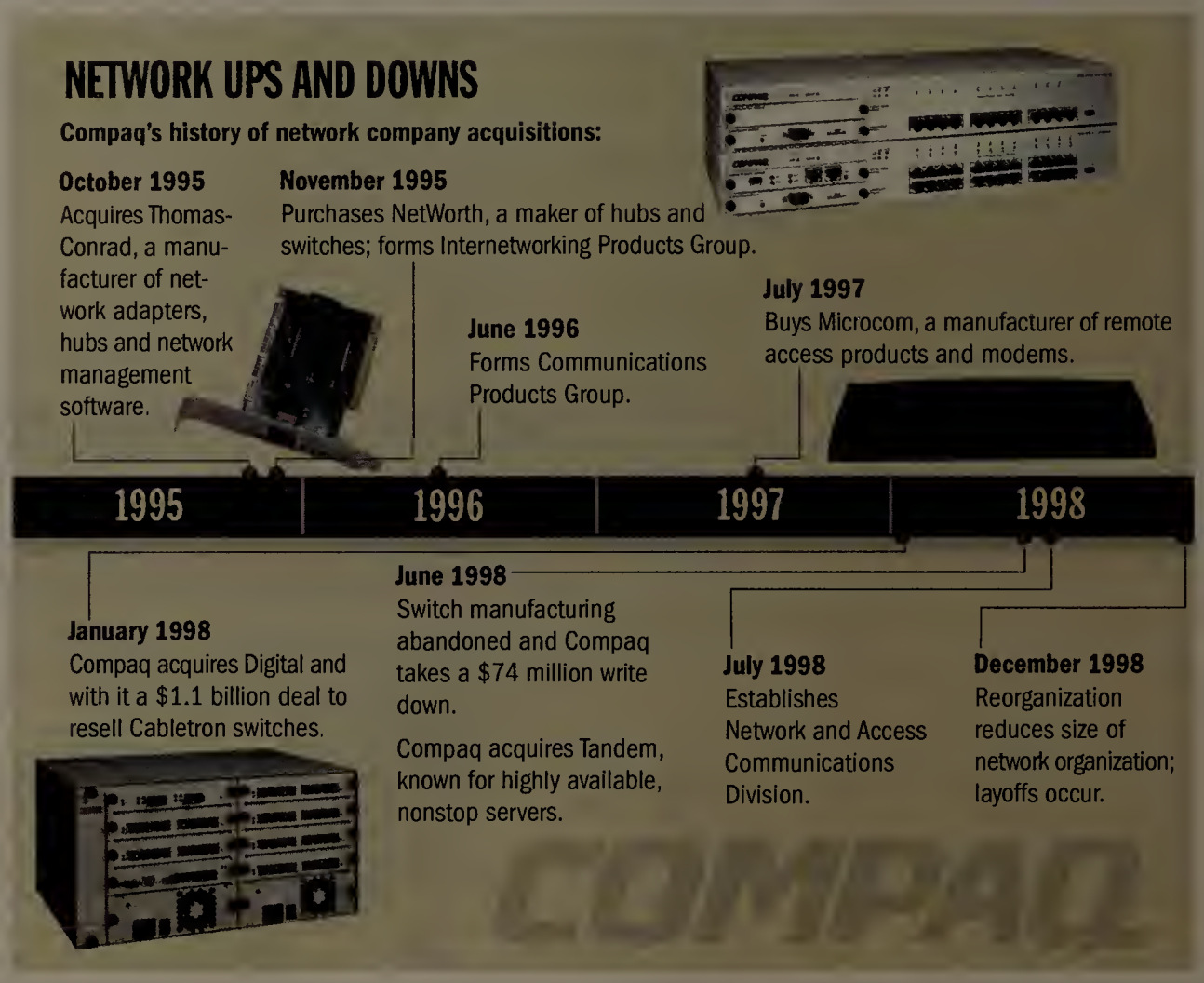

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Cable & Wireless

Continued from page 51

billing and order entry. MCI is still handling all the billing and a large portion of the order entry for Cable & Wireless. Malone says both tasks will be shifted to Cable & Wireless within the next six to eight months.

Cable & Wireless has also committed to investing $500 million to $600 million on IP network upgrades domestically with new equipment, Malone says. And worldwide, Cable & Wireless expects to spend more than $1 billion on IP network upgrades.

While Cable & Wireless users can expect some glitches when a service provider migrates to a new billing system, for most customers the worst is over, says Johna Till Johnson, director at Meta Group, a Stamford, Conn., consulting firm.

Even though the road has been a little rocky for Cable & Wireless' MCI Internet customers, Malone says in the end, user will be happy. "Clients that stick with us through the transition bumps will be rewarded with a more robust network than they have ever had in the past," Malone says. ■

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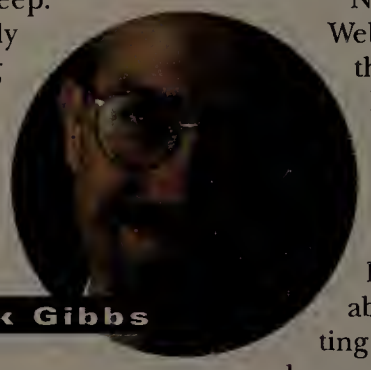
Backspin

Resolutions for Y2K minus one

Well, it is 1999. Yippee. Only 346 days to the end of the world as we know it.

And that bit of sarcasm reminds me that I just broke one of my New Year's resolutions, to wit, No. 10 on my list: "I will take the whole Y2K thing more seriously."

This one is hard to keep. I mean, the whole family discussed the Y2K thing over Christmas lunch, for God's sake! It was "pass the turkey and do you think the banks are ready?" So I have decided that I am going to get myself a generator in case the power fails, bury Krugerrands in the garden, and mount a machine gun on the roof.



Mark Gibbs

Now for the rest of my resolutions:

No. 9: "I will stop saying Microsoft Office is a good value and amazing engineering." Boy, just try to say that Microsoft Office is remarkable for its scope and amazingly low cost and geeks start acting like you insulted their mothers. (Honestly, Bill isn't paying me to say that.)

No. 8: "I will stop getting really ticked off by vendors that don't make it easy to find their contact information and pricing on their Web sites." This is going to be really hard. With my new DSL connection from Santa (which is awesome and took all of 20 minutes to install, but I digress . . .) I'll be spending even more time on the Web, and it is ridiculous not to be able to quickly find pricing and contact information.

No. 7: "I will learn to tolerate spamvitations to view hot, lusty, busty coeds for free, as well as pitches that start 'are you serious about getting rich' without hitting the delete key with such force that the keycap is launched into a low earth orbit." The spam thing is getting really silly.

I find it much easier to tolerate advertising messages that begin with "ADV," as I can file them in a folder and review them every few days. (Yes, I really do look at them. I've found some cool products that way.) But it's the deluge of ads for porno Web sites that really irritate me. I keep thinking of how peeved I'd be if my son were a few years older and reading that trash.

No. 6: "I will redesign my Web site." It is about time that I got around to this. I tried the "Gibbs Institute" thing on www.gibbs.com as a joke (see my previous columns if you don't know what I'm talking about), but I keep getting requests from students who want to see the curriculum. If you have any suggestions for the next iteration of my Web site, please let me know.

No. 5: "I will clean up my office." Ha! I say this every year. And every year I try but the books and magazines just pile up and at least once a week some kind of poltergeist sweeps through from the dark side and hurls papers, disks, CD ROMs and cables around with wild, demonic abandon. Perhaps I should have the office exorcised.

No. 4: "I will stop installing every cool piece of software that comes along." Damn, this is a hard one. I mean, how can you pass up test driving the alpha version of an artificial intelligence-based, neural network-driven, distributed processing-enabled screen saver?

No. 3: "I will actually delete old e-mail." But I will archive it. I'm sure that I might need it sometime.

No. 2: "I will get more sleep." To quote Warren Zevon ". . . when I die."

No. 1: "I will not (even though I might be tempted, which happens a lot because of all of the cool software I've installed and my new DSL connection) digress as much as I did in 1998." Perhaps I shouldn't even attempt this one.

Start the year right at nwcolumn@gibbs.com or on (800) 622-1108, Ext. 7504.

'Net Buzz

The latest on the Internet/intranet industry

Like having Linda Tripp on your desktop Go to the home page of **SpectorSoft Corp.** at www.spectorsoft.com, and you are greeted with this flashing message: "Your kids will hate Spector. Your employees will hate Spector. Because Spector records EVERYTHING."

Now, if you're cranky old **Mr. Burns** on *The Simpsons*, that's an enticing come-on. After all, even his omniscient wall of surveillance monitors can't prevent **Homer's** bungling and laziness from triggering the occasional core meltdown or other radiation-leaking antics at the **Springfield Nuclear Power Plant.**

But I've always been uncomfortable with the slightly sinister tone of pitches for Internet and PC monitoring software (not to mention security products). Sure, it's a rough world out there and, if you're a parent or an employer, it's best to be safe. Still, there's something vaguely **Orwellian** about appealing to people's innate distrust of others and inherent need to control.

I also wonder if such products make their users even more paranoid. You know, one minute you're monitoring your employees' Internet activities, the next you're covering the office windows with green lawn bags and dodging black helicopters.

Nonetheless, given the large workplace and home markets for such software, I would be remiss if I didn't do some hands-on testing on behalf of 'Net Buzz readers. So I grabbed a demo version of Spector 2.0 from the Melbourne, Fla.-based company's Web site, installed it and kept a diary.

Chris Nerney

Day 1: Download goes smoothly. A question in the online registration form asks, "What is your primary reason for trying Spector?" Among answers suggested in a pulldown menu are "Want to know if my husband is having an online affair" and "Want to know if my wife is having an online affair." Hmm. She has been acting funny lately, always running downstairs to "check our bank balance."

Day 2: Spector 2.0 seems to work as advertised. The software, which runs on any Windows PC, is like a camcorder, taking pictures of the activity on your monitor and allowing you to review the recorded information as it appeared to the original viewer.

I clicked on the play button and was amazed: At warp speed, I could see every Web site I visited, every application I downloaded, every stroke of the keyboard. It was how I imagine it would be when your life flashes before your eyes right before you die, without the banner ads.

The playback, I hasten to add, shows my (recent) Internet activity is strictly work-related. Unlike some people around here. Hey, I don't mind saying it. I might as well get them before they get me.

Day 3: Electronic sweep of my office comes up empty, though I'm keeping an eye on the suspicious-looking pen left behind by my boss.

Speaking of bosses, employers who want to monitor a worker's desktop activities from their own PC must create a unique data directory for each PC on which the software is installed. To view the recorded activity, the employer can use an open directory command to access the directory on the user's PC.

And to ensure employees don't know they're being spied on, you can use the **Stealth Mode,** which eliminates the little red box that normally is on when Spector is recording.

I'm probably being spied on right now. I wouldn't put it past some of these editors, always pushing us for more, more, more. Yeah, I'll give you some more. Here's more.

Day 4: Today my Spector software ordered me to wipe that smirk off my face, and then warned me not to try anything funny when I go to the men's room because the smoke alarm is watching. I am scared.

Spector 2.0 is available now for $49.95 per copy.

What are you looking at? Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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[1] Dell'Oro Group, November 1998.